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THE

NATIONAL CYCLOPÆDIA

OF

USEFUL KNOWLEDGE.

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LILAC——NORTH-WEST PASSAGE.

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THE

NATIONAL CYCLOPÆDIA

OF

USEFUL KNOWLEDGE.

LILAC. [SYRINGA.]

LILIA'CEÆ, an important natural order of Endogens, containing many of the most beautiful plants of that class of the vegetable kingdom. A large proportion, especially of those of cold countries, consists of bulbous plants, producing annually a stem which perishes after having produced its leaves and flowers; others have an annual duration with perennial fleshy roots; and a few acquire, in warm countries, a stem of very considerable size, as the dragon-tree, *Dracæna Draco*, of which there is an ancient specimen in Teneriffe with a stem many feet in diameter.

The greater part of this family are of no known use: we find however among them aloes, yielding the valuable purgative medicine of that name; squills (*squilla maritima*), whose bulbs secrete a viscid substance much employed as an emetic, diuretic, and expectorant; and several plants which yield a tough and valuable fibre, such as *Phormium tenax*, or New Zealand hemp, *Sanseviera zeylanica*, or bowstring or African hemp, *Yucca filamentosa*, &c. What are called alliaceous plants, such as the onion, garlic, &c., are species of this order, of which between 80 and 90 genera are known.

LI'LIUM, a genus of plants the type of the natural order *Liliaceæ*. *L. candidum*, common White Lily, blossoms early in the summer, and has been cultivated in our gardens from time immemorial. The roots are the only parts of the plant available in medicine, and they are frequently employed as emollient poultices, owing to the mucilaginous matter which they contain. It is however doubtful whether they are more efficacious than poultices formed of bread or farina. This species, as well as others, is cultivated in Siberia, and eaten as the potato. The scent of the lily is exceedingly powerful, and peculiarly distressing in some cases. Murray mentions an instance of death ensuing from exposure to the odour of this plant. *L. Martagon*, Turk's Cap Lily, though not a native of Great Britain, is naturalised in copses in many places.

All the species and varieties of *Lilium* are valuable as plants of ornament for the beauty of their flowers, which have a noble appearance. They are proper for the pleasure-ground, and, if planted with judgment, succeed each other in blooming upwards of three months. The common White Lily, the Orange Lily, and Martagon will thrive under trees. The orange-lily also answers well for small gardens and confined situations in towns and cities.

LILLE, the capital formerly of French Flanders, now of the department of Nord, is situated in 50° 38′ 44″ N. lat., 3° 3′ 37″ E. long., at a distance by railway of 170 miles E.N.E. from Paris, 51 S.E. from Dunkirk, and has 72,537 inhabitants. It stands in a fertile and level country, at the junction of the Haute-Deule and the Basse-Deule, as the two cuts of the canal that unites the Scarpe and the Lys are called. These two cuts are united by a third, called Moyenne-Deule, which passing west of the town conveys barges too heavily laden or too large to pass through any of the numerous channels that traverse the city for purposes of commerce or to drive the machinery of the numerous factories. The town is well built; the streets are regular, wide, and provided with foot-pavements; the houses are in general three or four stories high, and built of brick or limestone. It contains 34 squares and market-places, 30 bridges of all sizes, about 200 streets, a great number of lanes and courts, and about 10,000 houses, besides many factories and mills, which, together with a far greater number in the environs, announce to the traveller by their lofty chimneys that he is approaching one of the great hives of industrial activity. Lille, which is entered by 7 gates, is surrounded by very strong fortifications and wet ditches, and defended by a citadel said to be the masterpiece of Vauban. Its shape is nearly oval, its length within the walls being 2560 yards, and its breadth 1278 yards. The citadel is a regular pentagon of 426 yards' diameter; it is situated south-west of the town, and separated from it by a wide esplanade, which crossed by the Moyenne-Deule, and planted next the town with several avenues of trees, forms a fine promenade.

The public structures of Lille are few. The most remarkable are—the churches of La-Madeleine, St.-Maurice, and St.-Paul; the town-hall, which, built by Jean-sans-Peur in 1430, was for a long time the palace of the dukes of Bourgogne; the Mont-de-Piété, founded in 1610; the Paris gate, which is a triumphal arch in honour of

Louis XIV.; the general hospital; the large corn-stores at the end of the Rue Royale; the theatre; the concert-room, one of the finest in France; the museum, established in a fine old abbey, and containing the public library of above 20,000 volumes, a gallery of paintings, and the archives of the town; and the Napoléon bridge across the Moyenne-Deule, which unites the part of the esplanade that serves for a walking-place to the part next the citadel where the troops are drilled.

The manufactures of Lille are very important; they consist of all kinds of cotton goods; linen and linen thread, lace, blankets, and other woollen stuffs; paper, leather, beet-root sugar; steam machinery and ironmongery; gin, beer, and great quantities of oil, which is expressed in 300 windmills near the town; glass, soap, tape, hats, carpets, chemical products, &c. There are also iron and copper foundries, dye-houses, bleaching establishments, and sugar refineries. The trade in these various products, and in colonial produce, wool, hides, hops, coal, tobacco, chicory, &c. is extensive. The town is lighted with gas, and has communication by railway and by canal with all parts of France and Belgium.

Lille is the seat of tribunals of first instance and of commerce, and the head-quarters of the 2nd (formerly of the 16th) Military Division; it has a bank, a council of Prud'hommes, a college, a medical school, an academy of music, a school of painting, various establishments for the gratuitous instruction of working manufacturers, and a great number of charitable institutions.

LILLEBONNE. [SEINE-INFÉRIEURE.]

LILLO. [ANTWERP.]

LILLO, GEORGE, was born in 1693, and carried on the trade of a jeweller near Moorgate in London. He was the author of seven dramas, three of which are printed in every collection of acting plays. He died in 1739.

In the three plays, 'George Barnwell,' 'Arden of Feversham,' and 'Fatal Curiosity,' the author has but one purpose in view, to exhibit the progress from smaller to greater crimes.

A collection of Lillo's works was published in 2 vols. 8vo. in 1775.

LILLY, WILLIAM, was born May 1, 1602, at Diseworth, in Leicestershire. He removed to London in 1620, where he became servant to a mantua-maker. This situation he exchanged in 1624 for one of a less menial character. In 1627 his master died, whereupon Lilly married the widow, with whom he received the sum of 1000*l.*; but, his wife dying within a few years, he immediately took another, and thus augmented his fortune by 500*l.* In 1632 he began the study of astrology under one Evans, a clergyman who had been expelled from his curacy for practising numerous frauds under pretence of discovering stolen goods. The fame which Lilly soon acquired for casting nativities and foretelling events was such, that he was applied to, in 1634, to ascertain, 'by the use of the Mosaical or Miners' Rods,' whether there was not extensive treasure buried beneath the cloisters of Westminster Abbey. Permission having been obtained from the dean, on condition that he should have his share of whatever might be found, 'Lilly and thirty other gentlemen entered the cloisters one night, and applied the hazel rods;' but, after they had disinterred a few leaden coffins, a violent storm arose, which so alarmed them, that they all took to their heels, and ran home. In 1644 he published his first almanac, by the title of 'Merlinus Anglicus, Junior;' and such was the avidity with which the people received his prognostications, that the whole edition was sold in a few days.

During the contest between Charles I. and the parliament, Lilly was consulted by the Royalists, with the king's privity, as to whether the king should sign the propositions of the parliament, and he received 20*l.* for his opinion. At the same time he was employed by the opposite party to furnish them with 'perfect knowledge of the chiefest concerns of France,' for which he received 50*l.* in cash and an annuity of 100*l.* per annum. The latter he enjoyed only two years. Until the affairs of Charles declined, he was a cavalier; but after the year 1645 he engaged heartily in the cause of the parliament, and was one of the close committee to consult upon the king's execution. He died of palsy, June 9, 1681, and was buried at Walton-upon-Thames. The character of Lilly has been faithfully drawn by Butler under the name of Sidrophel, although some authors have supposed that character to have been intended for Sir Paul Neal. After the Restoration he made several applications to the ministry to be employed as a prophet, in which capacity he had been liberally patronised by the previous government, but in every instance he had the mortification of being refused.

LILY, LILYE, or LILLY, WILLIAM, was born at Odiham in Hampshire, about 1468, and at eighteen years of age was admitted a demy of Magdalen College, Oxford. Having taken the degree of B.A., he quitted the University, and travelled in the East. He certainly remained five years at Rhodes, and from Rhodes he went to Rome, and studied. On his return to England in 1509, he set up a private grammar-school in London, and became the first teacher of Greek in the metropolis. In 1512, Dean Colet, who had just founded St. Paul's school, appointed him the first master. He filled this useful and laborious employment for near twelve years. Lily died of the plague, at London, in February 1523, and was buried in the north churchyard of St. Paul's. Lily's principal literary production was his 'Brevissima Institutio, seu Ratio Grammatices Cognoscendæ,' 4to., Lond., 1513. It is still commonly known as 'Lily's Grammar.' The English rudiments were written by Colet, and the preface to the first edition by Cardinal Wolsey. The English Syntax was written by Lily; also the rules for the genders of nouns, beginning with 'Propria quæ Maribus;' and those for the præterperfect tenses and supines, beginning with 'As in præsenti.' The Latin Syntax was chiefly the work of Erasmus. Lily numbered Erasmus and Sir Thomas More among his intimate friends.

LILY, JOHN, was born about 1553, in the Weald of Kent. He became a student in Magdalen College, Oxford, in 1569. He took th

degree of B.A. in 1573, and that of M.A. in 1575. He seems to have lived chiefly in London, and produced nine plays and some satirical pamphlets. The time of his death is uncertain, but he seems to have been alive in 1597. He was a follower of the court, but lived and died poor. His 'Alexander and Campaspe,' acted not only at court but at the Blackfriars Theatre, was printed as early as 1584. His dramas are chiefly pastoral and mythological, and the characters and the style are alike unnatural. He attempted to reform the English language, in a work entitled 'Euphues, the Anatomy of Wit,' which was written in a style of peculiar affectation. This style was for a time very fashionable, had many imitators, and was called 'Euphuism.'

LIMA, the capital of the Republic of Peru in South America, is situated in 12° 2′ 34″ S. lat., and 76° 58′ W. long., about 6 miles from its port Callao, which is on the shores of the Pacific. [CALLAO.] Lima is built in a spacious and fertile valley, traversed by a small river called the Rimac. The river washes the northern walls of Lima, and over it there is a handsome stone bridge leading to the suburbs of St. Lazaro, and to the Alameda, or public walk. The city is walled round, but the walls are low. The houses are low, and have rarely more than one floor: they are lightly built, on account of the frequent earthquakes, which have repeatedly reduced the city to ruins. The streets are regular and wide, but the pavement is bad. The roofs of the houses are made of coarse linen cloth or cane, and few of the houses have glass windows. The city occupies a nearly triangular space, the base extending along the banks of the river. A fine street leads from the bridge to the Plaza Mayor, or great square, in the midst of which is a large fountain. On the north side of the square is the government palace, a large but gloomy-looking edifice; on the east side are the cathedral and the archiepiscopal palace; the former is a handsome building of considerable extent: on the west side is the town-hall and the city prison; the south side is occupied by private houses. Captain Wilkins, who visited Lima in 1821 and 1841, states that the intervening period of war and anarchy had greatly deteriorated the city.

Lima has 56 churches, and before the revolutionary war there were 46 convents of monks and nuns; but most of them have since been abolished. Colleges, schools, and charitable institutions are tolerably numerous.

The population is estimated at about 70,000, consisting of free Mulattoes, slaves, Indians and Mestizos, and a few Europeans. The manufactures are neither numerous nor extensive. The principal manufactured articles are utensils and vessels of silver, gilded leather, cotton cloth, gold lace, and epaulettes. Among the creole inhabitants are many rich families, who owe their fortunes to the mines, and are now large landed proprietors.

LIMACI'NEA, M. de Blainville's name for his third family of *Pulmobranchiata*, the first order of his second sub-class, *Paracephalophora monoica*. M. de Blainville adds, as an observation, that all the animals of this family are terrestrial, and that all feed on vegetable substances. *Testacella* however feeds chiefly on earth worms. [HELICIDÆ, LIMAX.]

LIMAX, the Latin name for those air-breathing naked gastropodous molluscs so injurious in the garden, and known vernacularly by the name of *Slugs*. Cuvier says, the slugs (*les Limaces*) have an elongated body, and for a mantle a fleshy compact disk, which occupies the anterior part of the body alone, and covers the pulmonary cavity only. This disk contains, he adds, in many species a small oblong and flat shell, or at least a calcareous secretion in lieu of it. The orifice of respiration is on the right side, towards the front, and the anus is pierced at its posterior border. The four tentacles are put forth and withdrawn by unrolling themselves like the fingers of gloves, and the head itself can be withdrawn in part under the disk of the mantle. The organs of generation open under the right upper tentacle. There is but one jaw (upper), in the form of a dentilated crescent, which serves them to gnaw with much voracity the herbs and fruits to which they do so much damage. Their stomach is elongated, simple, and membranous.

Cuvier then notices the following genera—*Arion;* example, the Red Slug: *Limax;* example, the great Gray Slug, often found in damp cellars; the small Gray Slug and others: *Vaginulus*, *Testacella*, and *Parmacella*.

Reverting to the slugs of our fields and gardens, the devastations they often commit are of serious consequence. Gardeners are constantly racking their invention to free themselves from these devouring hosts. Quicklime, soot, fine coal ashes, and saw-dust, have been used as defences for young and tender plants. The virtue of the first is soon exhausted, and the slugs do not care much for the second after awhile; but, if the soot be plentifully and frequently renewed, it will keep them away in great measure. Coal-ashes, not too coarse, and saw-dust annoy them by sticking to their foot and impeding them. A stout, coarse horsehair line, such as is used for hanging clothes out to dry, coiled round the stems of wall fruit-trees and stretched along the wall, will operate as a protection to the fruit from both snails and slugs, in consequence of the bristly surface presented to them, and which they shrink from encountering. Care must of course be taken that they do not get under it. Watering evening and morning with strong fresh lime-water is said to have a good effect, for it penetrates about the roots of the plants and into the earth, where they lie hid. Thin slices of any vegetable of which they are more fond than of the crop to be protected will allure them, and they may be thus killed by scores early in the morning by dividing them suddenly with a sharp instrument. The dead bodies should be left on the spot as a bait, for we have seen the living slugs preying upon the exposed bowels of the dead ones, most probably attracted by the half-digested vegetable matter. Ducks destroy great numbers of these pests, whilst they improve themselves, but they are apt to trample down a young and delicate crop of vegetables.

LIMB. (Astronomy.) The edge of a planet

is called its limb; also the edge of any circle which forms part of an astronomical instrument.

LIMBORCH, PHILIP VAN, was born at Amsterdam, June 19, 1633, and was educated at the University of Utrecht. He was one of the most distinguished of the Remonstrant or Arminian theologians, whose tenets were condemned at the Synod of Dort in 1618. [DORT, SYNOD OF.] He died the 30th of April, 1712.

The most important of Limborch's works are: 'Præstantium ac Eruditorum Virorum Epistolæ,' Amst., 1660, 1684, 1704; 'Theologia Christiana,' 1686; 'De Veritate Religionis Christianæ, amica Collatio cum erudito Judæo,' 1687; 'Historia Inquisitionis,' 1692; 'Commentarius in Acta Apostolorum et in Epistolas ad Romanos et Hebræos,' 1661. He also edited many works of the principal Arminian theologians.

LIMBURG, a province of Belgium, lying between 50° 44′ and 51° 18′ N. lat., 5° 2′ and 5° 52′ E. long., is bounded N. by North Brabant, E. by the duchy of Limburg, from which it is separated by the Maas, S. by Liège, and W. by Antwerp and South Brabant. The area is 928 square miles, and the population in 1846 was 185,913. The surface is flat, except in the south, where there are a few hills. The east of the province along the left bank of the Maas is fertile in corn, hemp, flax, tobacco, madder, fruits, &c. The district also between the Jaar and the Demer possesses a fertile soil. The rest of the province consists of a sandy soil, presenting towards the north extensive barren heaths, and many marshes. The pasture-lands are extensive, and cattle-feeding is more attended to than tillage; there is a good breed of horses, and bees are carefully tended. The principal rivers are the Maas, which receives the Jaar on its left bank at Maastricht; the Demer, which, rising W. of Maastricht, runs westward past Hasselt, and, having received several small feeders from both banks, enters South Brabant on its way to join the Dyle, a feeder of the Scheldt; and the Dommel, which rises in the north of this province, and flows through North Brabant, where it enters the Maas at Crèvecœur.

Hasselt, the capital of the province, is a well-built town of 7600 inhabitants, on the Demer. It has some manufactures of linen, leather, tobacco, beer, spirits, point lace, &c. A branch railroad leads from Hasselt through St.-Trond to the Liège-Malines Line, which it joins at Landen.

St.-Trond, 10 miles from Hasselt, stands on the Meselbeck, a feeder of the Demer, and has 8500 inhabitants. It is joined by a branch railroad to the Liège-Malines Line. The chief manufactures are fire-arms, and lace; there are iron-forges in the neighbourhood.

Bilsen, a small place of 2900 inhabitants, on the left bank of the Demer, has iron mineral springs and potteries. *Tongres* or *Tongern*, on the Jaar, is a well-built town with 4950 inhabitants, who manufacture chicory, leather, and hats. In a valley, near this town, there is an iron mineral spring, which has been described by Pliny. *Maaseyk* or *Mazeik*, a town of 3950 inhabitants, stands in the north-east of the province on the left bank of the Maas, and has manufactures of leather, paper, hats, tobacco, pottery, beer, spirits, and ropes.

LIMBURG, a Dutch province with the title of duchy, extending between 50° 45′ and 51° 47′ N. lat., 5° 35′ and 6° 13′ E. long., is bounded N. by Gelderland, E. by the Prussian Rhein-provinz, S. by the Belgian province of Liège, and W. by those of North Brabant and Limburg. The area is 848 square miles, and the population in 1848 was 202,942. It extends 71 miles from N. to S., with an average breadth of 14 miles, but at some points the width does not exceed 3 miles. In the southern part extending along the right bank of the Maas, the soil is fertile, but in the north bogs, moors, and marshes cover a great part of the surface. Cattle-breeding and agriculture are the chief occupations of the inhabitants; the products are similar to those of the Belgian province of Limburg. The principal rivers besides the Maas are its feeders from the left, the Roer and the Neisse.

Maastricht, the capital of the province, stands on the Maas, which is here crossed by a handsome stone bridge, in 50° 48′ N. lat., 5° 43′ E. long., and has 22,000 inhabitants. The part of the town that stands on the right bank of the Maas, is properly a suburb, and called *Wyck*. The town is regularly and well built, and contains several spacious squares, one of which, the parade, is inclosed by an avenue of trees. The town-hall in the great market-place, and the church of St.-Gervais, are the most remarkable buildings. There are 6 Roman Catholic and 3 Calvinist churches, 2 hospitals, 2 orphan asylums, and a lyceum. The manufactures consist of woollen cloth, flannel, leather, fire-arms, soap, beer, and spirits. The town is very strongly fortified; the citadel is erected on a hill called Petersberg, on the west bank of the Maas. Underneath this hill is a stone quarry of great extent, abounding in many curious and interesting fossils; it is said to be intersected by above 20,000 passages, forming a most intricate labyrinth.

The other towns are—*Sittard*, N. by E. from Maastricht; population, 3325: *Roermonde*, or *Ruremonde*, a strongly fortified place at the entrance of the Roer into the Maas, with 5300 inhabitants, who manufacture woollen cloth, leather and beer: *Vaels*, a frontier town, a little W. of Aix-la-Chapelle, with 2650 inhabitants: *Venloo*, a fortified town on the right bank of the Maas, and near the Prussian frontier, which has 6500 inhabitants, several breweries, distilleries, tobacco-factories, vinegar-works, tin and lead-foundries, tan-yards, and spinning-mills; the fort St.-Michael, which forms part of the defences, stands on the left bank of the Maas, and is joined to the rest of the town by a bridge of boats: and *Veerdt*, which is situated in a marshy district, near the borders of North Brabant, on the Bree, and has 6000 inhabitants, who manufacture hats, cloth, tobacco, chocolate, candles, leather, and stockings.

LIMBURG. [LIE'GE.]

LIME. [CALCIUM.]

LIME, *Medicinal Properties of*. Though lime exists in almost all plants, yet it is more particularly the characteristic element of animal struc-

tures, into which it is introduced with the food, as well as often by the water drunk, especially when hard. A deficiency of lime in the body causes a softness of the bones to result; while an excess of it occasions preternatural induration of the bones, morbid growths from them, or exostoses, ossifications of the cartilages, of the heart and arteries, as well as depositions of calcareous concretions in various glands and cavities, such as the urinary bladder. [CALCULUS.] The action of lime on the human system varies considerably according to the state in which it is when introduced into or applied to it. Thus quick-lime is violently escharotic, causing inflammation and often decomposition of the part which it touches, and is never employed save when the actual destruction of the part is intended. In a state of great dilution, such as that of lime-water, or when rendered mild by combination with carbonic acid or phosphoric acid, it scarcely produces any immediate or direct action beyond what results from its combining with the acids of the stomach, and, if in considerable quantity, absorbing the mucous and other secretions. It likewise checks the secretions of mucous membranes with which it is not brought into contact, such as those of the bronchia. After its absorption into the system, it augments the secretion of the kidneys, and at the same time hinders the excessive formation of uric acid.

LIME. [MANURE.]

LIME-TREE. [TILIA.]

LIMERICK, an inland county of the province of Munster, in Ireland, bounded N. by the æstuary of the Shannon, W. by Kerry, S. by Cork, and E. by Tipperary. It lies between 52° 17′ and 52° 47′ N. lat., and between 8° 5′, and 9° 22′ W. long. The greatest length E. to W. is 54 miles; the greatest breadth N. to S. is 35 miles. The area is 1065 square miles, or 680,042 acres. The population in 1841 was 281,638.

The general surface of Limerick is an undulating plain, sloping towards the Shannon on the north, and surrounded on its southern and western borders by a margin of mountain groups and hilly uplands. A mountainous tract occurs also in the north-eastern extremity of the county. The north-east mountains are the Slieve Phelim, and the Bilboa groups, which are drained by the Mulkern and Newport rivers. The country between the western declivities of the Slieve Phelim hills and the Shannon is mostly flat and boggy. The principal features of the great plain, extending from the Mulkern westward and southward to the mountains on the borders of Kerry and Cork, are the rivers Maigue and Deel, which traverse it from south to north in nearly parallel courses. The basin of the Maigue embraces the entire eastern division of the county; and the chief feeders to that river are the Looba, the Star, and the Camogue. In the plain watered by these rivers is Loch Gur, a picturesque sheet of water three quarters of a mile in length, embosomed among romantic knolls, some of which have a considerable elevation. The country north of the Camogue, between it and the Mulkern and Shannon, has a more varied surface than that above described. The district west of the Maigue is watered by the Deel, a river of nearly equal size with the Maigue. The Geale, the Feale, the Ulahane, and other small streams water this portion of the county; and some of the hills, such as Knockfeernha, Kilmeedy, and Knockpatrick, attain a height of nearly 1000 feet.

Although the Shannon does not lose the character of a river until after passing beyond the bounds of this county, yet for all the purposes of commerce it is equivalent to an equal length of sea-coast from Glin to Limerick, a distance, including the windings of the river, of about 35 miles. With the exception of a few points, which may be improved at a small expense, the navigable channels of this part of the river are capable of admitting vessels of heavy burthen as far as the pool of Limerick, situated about two miles below the city. Great exertions have been made to improve the navigation of the river. [SHANNON.]

The county is moderately well supplied with roads, but has no canals. Portions of the Limerick and Waterford, and of the Great Southern and Western (Dublin to Limerick and Cork) Railways, will pass through the county.

The level part of the county consists of carboniferous limestone. The mountain groups and detached eminences of its eastern and southern margins are formed by the protrusion of older rocks; and the high lands on the west consist of more recent series superimposed. The Slieve Phelim and Bilboa groups, in common with the extensive range of which they form a part, consist of a nucleus of clay-slate supporting flanks of yellow sandstone and conglomerate disposed in conformable beds. Small portions of old red sandstone, crystalline greenstone, flinty limestone, and other rocks, appear at various parts of the surface. Pallas Hill is distinguished by the presence of columnar basalt, which overlies the amorphous trap of its northern brow. The mountainous district on the west of the county belongs to the great Munster coal-tract, which is probably the most extensive in the British islands; but the coal is slaty, and the mines difficult to work on account of the great inclination of the beds. Fine dark-coloured marble, and small quantities of iron, copper, and lead are met with in the county.

A tract of extraordinary fertility, called the Golden Vein, occupies the greater part of the eastern plain of Limerick. The soil is a rich, mellow, crumbling loam, and is equally suited to grazing or tillage: it is chiefly in pasture. A still richer soil is that of the 'Corcasses,' which extend for fifteen miles along the southern bank of the Shannon, from a little below Limerick to the embouchure of the Deel. They yield the greatest wheat-crops raised in Ireland; and their produce of potatoes is also large. The soil of the remainder of the limestone plain is very good for tillage, and yields an excellent pasture for dairy cattle and sheep. Not more than one-fourth of the level district is, however, under tillage. Pasture and dairy farming are the staple occupations of the people. Great quantities of butter are made. Pigs of a very superior description are bred in great numbers by the dairy farmers. Of the 680,042 acres in the county, 204,683 were

under crops in 1847, the chief being—corn and beans, 117,783 acres; meadow, 57,839 acres; potatoes, 12,141 acres; turnips, 14,099 acres.

There is a small manufacture of coarse woollens for home consumption, and the bleaching of linen is carried on, but on a contracted scale. There are paper-mills, and large and powerful mills for the grinding of corn.

Divisions and Towns.—Limerick is divided into 12 baronies. It is in the dioceses of Killaloe and Limerick. It is in the Munster circuit, and the assizes are held in the city of Limerick. The county returns 2 members to parliament, and 2 members are returned for the city of Limerick.

The following are the principal towns, with the population of each in 1841 :—

Askeaton, 18 miles W.S.W. from Limerick, is situated on the river Deel, about two miles above its confluence with the Shannon. The Deel is navigable for vessels of 60 tons up to the town, which contains a church and Roman Catholic chapel. Population, 1862.

Kilmallock, 20 miles S. by E. from Limerick, is situated on the small river Labach. It is a very ancient town, and was formerly very important on account of its strength and a monastery founded there in the sixth century. It was the chief town of the Desmond branch of the Geraldines, was surrounded by a wall, of which considerable portions remain, and was fortified; but the fortifications were destroyed by Cromwell, and again in 1690 by the Duke of Berwick after they had been partly restored. The town consists chiefly of a street of stone houses frequently three stories high, with mullioned windows and arched doorways of cut stone. The ruins of this place, both civil and ecclesiastical, are very interesting. Population, 1408.

Limerick. [LIMERICK.]

Newcastle, a market-town, 25 miles S.W. from Limerick, is situated on the Arra, a beautiful stream, which flows through the town in its progress to the Deel. Coarse cloths are manufactured in the town, which contains a neat modern church, and supplies commodities to a large rural district. Population, 2917.

Rathkeale, a market-town, 17 miles S.W. from Limerick, is situated on the west bank of the Deel. It contains many good houses and shops, and has a good retail trade. From the various ruined castles in the immediate vicinity, and the remains of a priory in the town, it appears to have been a place of considerable antiquity. It contains a court-house, union workhouse, and several places of worship. Population, 4201.

History and Antiquities.—Prior to the arrival of the English, Limerick constituted part of the petty kingdom of Thomond, or North Munster. Donald O'Brien was prince of this territory at the time of the English invasion; and, in order to carry out a feud with a rival chieftain, he was among the first to tender his homage and receive an English garrison into his city, in 1172. But he did not long continue loyal, and, after many conflicts, a considerable portion of Limerick was given by King John to the Fitzwalters, the Fitzgeralds, and other great families. These new settlers brought in a colony of English, chiefly from Bristol and Chester, who took up their residence chiefly in the city and towns near the river. The greater portion of the county was possessed by the powerful family of the Fitzgeralds, Earls of Desmond, until their final forfeiture by Gerald, the sixteenth earl, in 1586. The estates of this unfortunate nobleman in the county of Limerick alone consisted of 96,165 acres, which were granted among twelve individuals, most of whose names are now extinct in the county. The war which ensued throughout Munster was an obstinate and disastrous one. On the breaking out of the rebellion of 1641, the city of Limerick and all the chief castles of the county, with one or two exceptions, fell an easy prey to the insurgents, in whose hands they for the most part continued until the capture of Limerick by the parliamentary forces under Ireton, in 1651. The forfeitures which ensued embraced almost the entire county, and introduced a numerous new proprietary. The war of the Revolution terminated in further forfeitures. From this time until the latter end of the last century the county continued undisturbed; but many outbreaks have occurred in it during the present century.

Limerick is among the richest of the Irish counties in antiquities. There are extensive Cyclopean remains on the hill of Knockfennel, near Loch Gur. The fort on the western pinnacle of the hill is a circle of 360 feet in circumference, with a wall ten feet thick, composed of massive blocks of dry stone, and with other walls of similar construction. Military earthen works are numerous in all parts of the county. At Carrigeen, near Croom, are the remains of a round tower fifty feet in height; and there are indications of two others. The ruins of religious houses are very numerous. Adare, Kilmallock, and Askeaton are peculiarly interesting from the number and extent of their ecclesiastical remains. The river Camaigue alone has the ruins of seven religious houses on its banks. Manister-Nenagh, the most considerable of these, is the most extensive pile of monastic ruins in Munster. Of the castles of the early proprietors, nearly one hundred still remain. Of these the most remarkable are Croom Castle, Shane Castle, Cappa Castle, Castle Connel, and Carrick agonniel. The last-named, a stronghold of the O'Briens, is boldly situated on a basaltic rock rising suddenly from the plain to a height of several hundred feet over the southern bank of the Shannon; it was blown up by General Scravenmore in the war of the Revolution; but although 84 barrels of gunpowder were exploded under it, two of the towers are still tolerably perfect. There are several stone circles, and other supposed remains of Druidical worship, throughout the county.

LIMERICK, a city and county of a city, and a parliamentary borough, is situated at the interior extremity of the æstuary of the Shannon, 11 miles W.S.W. from Dublin, 52° 40′ N. lat., 8° 3 W. long. The population in 1841 was 48,39 The city returns 2 members to parliament. It the fourth town in importance in Ireland, and the capital of the west, as Dublin is of the ea

Belfast of the north, and Cork of the south. The city is chiefly built on the county of Limerick side of the river. The island on which the old town of Limerick stands was probably selected as the site of a city from the circumstance of this being the first point at which the Shannon is fordable above its æstuary. The island, called King's Island, is about a mile in length, by from a quarter to half a mile in breadth, and lies nearly north and south, having the main stream of the Shannon, about 500 feet in width, on the western side, and a smaller branch, called the Abbey River, of an average breadth of 200 feet, on the east and south. This portion of Limerick is called Englishtown. Another portion called Irishtown occupies the southern bank of the river, and another portion called Newtown Perry, entirely of modern erection, occupies elevated ground parallel with the river, below the union of its two branches, and derives its name from the Perry family, who were owners of the land. A suburb called Thomond Gate is situated on the county of Clare side of the river, at the end of Thomond Bridge, which was formerly the only entrance to the ancient city, and was defended by a strong castle. There are six bridges over the river, one of which is a swing-bridge, through which vessels pass to the upper basin and quays. The streets and houses in Englishtown are said to resemble those of the city of Rouen, but it presents an appearance of decay and misery. The streets of Irishtown are wider and the houses more modern. Newton Perry in many parts exhibits an appearance little inferior to the best parts of Dublin, with spacious streets, handsome houses, and well-stocked shops.

The chief public building are—the court-house, gaol, custom-house, commercial buildings, lunatic asylum, 4 barracks, several hospitals, the cathedral (founded in 1180 and rebuilt in 1490), 5 Protestant churches, 7 Roman Catholic chapels, 5 or 6 other places of worship for Dissenters, and several public schools. There are distilleries, breweries, tanneries, foundries, flour-mills, and some ship-yards. The city is divided into 5 wards, and is governed by 10 aldermen and 30 councillors. The mayor is admiral of the port, with jurisdiction from three miles above the city to the open sea. The assizes for the city and county of the city are held here. Vessels of 1000 tons' burthen can approach within five miles of the city, and those of 400 tons can unload at the quays. By the inland navigation of the Upper Shannon, and the Grand Canal and Royal Canal, the city has communication with Dublin, as well as with the country for 230 miles along the course of the Upper Shannon. The number of ships registered at the port of Limerick, Jan. 1, 1848, was 112 (14,294 tons). The number of sailing-vessels, coastwise, Jan. 1, 1847, to Jan. 1, 1848, was, inwards, 614 (72,733 tons); outwards, 509 (49,525 tons); steam-vessels, 3 (418 tons). The number of vessels, to and from colonies and foreign ports, was, inwards, 431 (84,958 tons); outwards, 409 (87,703 tons).

Limerick lays claim to high antiquity, and is said to have been of some importance as early as the fifth century. It was in the possession of the Danes for some time, and was also held by the O'Briens, kings of Munster, till the first hostile landing of the English in 1170. From this time, down to the treaty of Limerick in 1692, the city had its full share in the vicissitudes and calamities caused by the wars, feuds, and rebellions to which the country was subject.

The bishopric of Limerick is now joined with those of Ardfert and Aghadoe, thus forming the united bishopric of Limerick, Ardfert, and Aghadoe.

LIMESTONE. This term is applied to a great variety of earthy compounds, in which carbonate of lime is the predominant ingredient. In regard to the chemical composition of limestones, we may notice that some, as statuary marble, are nearly pure carbonate of lime; others, as the dolomitic rocks of the Alps, contain a certain proportion of carbonate of magnesia; and some are penetrated by bituminous matter, as the black marbles of Yorkshire. Limestones also vary in quality, and become debased by admixture with sand, clay, oxide of iron, pyrites, &c.; so that there is in fact a real gradation from limestone to schist, to sandstone, to shale, to ironstone, &c. Limestones have a crystalline aggregation, as statuary marble, and generally the limestones mixed with primary systems of strata; or they are composed of small crystalline grains, as the magnesian limestone of Mansfield in Nottinghamshire; full of round concretionary parts, as the oolites of Portland, Bath, and Oxford; earthy, as chalk, and some magnesian limestones; or compact, as the lithographic stone of Solenhofen. The beds of calcareous rocks are of every thickness, from a mere lamina to some yards thick. The colours of limestone vary indefinitely. When argillaceous matter is mixed with the calcareous basis of the rock, the colour generally approaches to blue; magnesian and oolitic limestones are often yellow; primary limestone and chalk are generally white; the Tiree marble is red; some of the Derbyshire and Kilkenny marble is black; and there are many-veined and party-coloured marbles, as those of Babicombe, Sienna, &c. Limestones are rich in organic remains.

LIMIT; LIMITS, THEORY OF. The word limit implies a fixed magnitude to which another and a variable magnitude may be made as nearly equal as we please, it being impossible however that the variable magnitude can absolutely attain, or be equal to, the fixed magnitude. In this strict sense of the word there are two conditions which must be fulfilled before A can be called the limit of P: first, P must never become equal to A; secondly, P must be capable of being made as nearly equal to A as we please.

The method of limits is in reality nothing more than one way of evading the use of the word infinite in an absolute sense.

LIMITATION. [STATUTES OF LIMITATION.]

LIMMA, in ancient Greek music, may, for all practical purposes, be considered as the minor semitone of the modern scale.

LIMNE'ANS, in French *Lymnéens*, or more properly *Limnéens* (λίμνη, *limnē*, a marsh, pool, or lake), Lamarck's name for a family of fresh-

water testaceous molluscs, consisting of the genera *Planorbis*, *Limnæa*, and *Physa*. The family name now in general use is *Limnæidæ*.

Lamarck collected these three genera in the following order: *Planorbis*, *Physa*, and *Limnea*, under one family, his *Lymnéens*, with the following definition :—

Amphibian Trachelipods, generally deprived of an operculum, and having flattened tentacles. They live in fresh water, and come to respire the air at the surface.

Their shell is spirivalve, most frequently smooth on the external surface, and always having the right edge of its aperture sharp, and not reflected. According to Mr. Garner, *Planorbis* respires both air and water. 'Linn. Trans.,' vol. xvii. p. 493.

The *Limnæidæ* are very common in ponds, ditches, rivers, and streams. They deposit their eggs enveloped in a glairy substance like clear jelly, on the leaves of water-plants, or on stones, but generally on the former, and these are often to be found on the leaves of water-cresses brought to the table. The shells of the *Limnæidæ* are very delicate and fragile, and their external border trenchant. The molluscs have only two tentacles carrying sessile eyes at the internal side of their base ; the eyes are never at their summit.

Fossil Limnæidæ.—Fossil Limnæidæ occur in various fresh-water formations, both in our island and the continent, and in some places they are abundant, and some of the species are identical with those yet existing.

LIMNO'RIA. [Isopoda.] In 1838 the Rev. F. W. Hope exhibited to a meeting of the Zoological Society a piece of deal perforated throughout by *Limnoria terebrans*, in which many of these destructive crustaceans might still be detected; and he stated that the oaken piles of the pier at Southend, Essex, had been cased with deal, and then surrounded with a sheating of iron, to protect them from the *Limnoriæ*. Instead of producing the desired effect, this plan appeared to have accelerated the destruction of the piles; for the *Limnoria* made its way from beneath between the sheathing and the pier, and very quickly destroyed the deal casing, as shown by the piece exhibited. Mr. Hope expressed his belief that wood could not by any means be effectually shielded from this animal, if exposed to its attack; and that iron, protected from the decomposing action of the water by some varnish, although requiring a much greater outlay at first, would in the end be found the least expensive of the two.

LIMOGES, the capital of the French department of Haute-Vienne, is situated on the summit and slope of a hill, on the right bank of the Vienne, which is here crossed by three bridges, 236 miles S. by W. from Paris, in 45° 49′ 52″ N. lat., 1° 15′ E. long., and has 29,870 inhabitants. It takes its name from the *Lemovices*, a Celtic tribe whose capital it was. By the Romans it was called *Augustoritum*, and under them it was a place of considerable importance. It was taken after a revolt, in 1370, by the Black Prince, who put 3000 of the inhabitants to the sword. The older part of the town consists of narrow and steep streets, with timber-framed houses : the more modern part contains broad and straight streets, and two handsome squares. Of the public edifices the principal are the town-hall, the cathedral of St. Étienne, a fine Gothic edifice of the thirteenth century; the churches of St.-Michel-des-Lions, and St.-Pierre-du-Queyroix; the episcopal palace, and the beautiful fountain of Aigoulène. The public library of 12,000 volumes, the cavalry barracks, the prefect's residence, the theatre, and the hospitals also deserve notice. There is a great monthly cattle market, and nine yearly fairs.

Limoges is the seat of a bishop, whose diocese includes the departments of Creuse and Haute-Vienne; and of a Cour Royale and University Academy, the jurisdictions of which comprehend the departments of Haute-Vienne, Corrèze, and Creuse. It has tribunals of first instance and of commerce, a college, a mint, an ecclesiastical college, and several charitable institutions. A great number of books are printed in Limoges ; and the manufacture of fine and coarse woollen cloths, paper, porcelain, and crucibles is important. Flannel, cotton handkerchiefs, glue, nails, woollen yarn, room paper, articles in papier-mâché, &c., are also made. There is besides a considerable commerce in corn, chestnuts, wine, brandy, liqueurs, iron, copper, tin, kaolin, &c.

LIMO'NIA, a genus of plants of the natural family of *Aurantiaceæ*. Several of those described under this genus by Dr. Roxburgh have been referred to *Atalantia* and *Glycosmis*. Most of the family abound in essential oil, and the leaves of some of the Limonias are fragrant. The fruit, though small, of *L. acidissima* and *L. crenulata* is very acid.

LIMOUSIN, one of the old French provinces which now form the departments of Corrèze and Haute-Vienne. It was divided into Upper and Lower Limousin, with Limoges and Tulle for the respective capitals, each of which gave title to a bishop. Limousin was united to the French crown by Henri IV., who inherited it from his mother, Jeanne d'Albret.

LIMOUX. [Aude.]

LINA'CEÆ, a small natural order of plants, related to *Cistaceæ*. The whole order contains only two genera, *Linum* and *Radiola :* the former comprehends many species, the most important of which is common flax, *Linum usitatissimum*, the woody tissue of whose stems is so valuable for its toughness and fineness, and whose seeds furnish linseed oil.

LINACRE, or LYNACER, THOMAS, one of the most eminent physicians of his age, descended from the Linacres of Linacre Hall, in the parish of Chesterfield in Derbyshire, was born at Canterbury about 1460. He received his first education in his native city, under William Tilly, or De Selling, and afterwards entered at Oxford, where he was chosen a fellow of All Souls' College in 1484. He studied also at Bologna, and afterwards at Rome, under Hermolaus Barbarus. He applied himself particularly to the works of Aristotle and Galen, and is said to have been the first Englishman who made himself master of those writers in the original Greek. He also translated several of Galen's treatises into elegant Latin, and

with Grocyn and William Latymer undertook a translation of Aristotle, which was never completed. On his return to England, he was incorporated M.D. at Oxford, which degree he had taken at Padua, and gave temporary lectures in physic, and taught the Greek language at Oxford. His reputation became so high that King Henry VII. called him to court, and intrusted him with the care both of the health and education of Prince Arthur.

In the reign of Henry VIII. Linacre stood at the head of his profession, and showed his attachment to its interests by founding two lectures on physic in the university of Oxford, and one in that of Cambridge. He may also be considered the founder of the College of Physicians in London; for in 1518 he obtained letters-patent from King Henry VIII., constituting a corporate body of regularly bred physicians in London, in whom was vested the sole right of examining and admitting persons to practise within the city and seven miles round it, and also of licensing practitioners throughout the whole kingdom, except such as were graduates of Oxford or Cambridge, who by virtue of their degrees were independent of the college, except within London and its precincts.

Highly as Linacre was esteemed in his profession, he became desirous to change it for that of divinity, or rather to combine the two pursuits. In 1509 we find him in possession of the rectory of Mersham, which he resigned in the latter part of the same year, and was installed into the prebend of Eaton in the church of Wells; and afterwards, in 1518, he became possessed of a prebend in the cathedral of York, where he was also for a short time precentor. He had also other preferments in the church. He died Oct. 20, 1524, and was buried in St. Paul's Cathedral, London.

Besides his translation of Galen, he published a translation of Proclus, 'De Sphæra,' which was printed in the 'Astronomi Veteres' of 1499. Of his other works one of the most learned was his treatise 'De Emendata Structura Latini Sermonis libri sex,' printed at London immediately after his death in 1524, and frequently reprinted in later years in the 16th century.

LINA'RIA, a genus of plants belonging to the natural order *Scrophulariaceæ*. *L. Cymbalaria*, the Ivy-Leaved Toad-Flax, is a native of Europe, chiefly on old walls. It grows abundantly in Italy and Sicily, and is found in Great Britain. There are several varieties of this species. *L. Elatine* is a native of Europe and Africa, and is found in chalky corn-fields in Great Britain. *L. spuria*, *L. minor*, *L. repens*, *L. pelisseriana*, and *L. Italica*, are all natives of Great Britain. *L. vulgaris* in some places is called 'Butter and Eggs.' Gerard names it Wild-Flax, Toad-Flax, and Flax-Weed. It abounds in an acrid oil which is almost empyreumatic. Taken inwardly, it induces nausea. It has been advised in dropsy, but Haller and others disapprove of it. When united with milk, the juice is a poison to flies. The whole of the species of Linaria have an elegant appearance, and are therefore suited for flower gardens.

LINCOLN. [LINCOLNSHIRE.]

LINCOLN, PORT. [SOUTH AUSTRALIA.]

LINCOLN COLLEGE, Oxford, was founded in 1427, by Richard Flemming, bishop of Lincoln, for a rector and seven fellows; it was afterwards greatly augmented by Thomas Rotherham, bishop of Lincoln, who added five fellowships, and gave a body of statutes to the foundation, in which he limited the election of the fellows to the old dioceses of Lincoln and York, with the exception of one to the diocese of Wells. This was in 1479. Lord Crewe, bishop of Durham, in 1717 made an addition to the emoluments of the rector and fellows, and in 1718 endowed twelve exhibitions of 20*l*. a year a-piece. The scholarships and exhibitions received a further augmentation at a later time by the will of Richard Hutchins, D.D., rector from 1755 to 1781.

The present foundation consists of a rector, 12 fellows, 8 scholars, 12 exhibitioners, and 1 bible-clerk. The total number of members upon the books in January 1848 was 209. The buildings of Lincoln College retain much of their original character. They consist of two quadrangles, besides six sets of rooms erected at a later period. The largest quadrangle includes the rector's lodgings, library and hall, built in the 15th century; the library was originally the chapel. The smaller court was in part built about 1612 by Sir Thomas Rotherham. The present chapel, upon its south side, was built in 1631, by Archbishop Williams. The windows are rich in painted glass procured by the archbishop from Italy in 1629. In 1818 the whole front of the college was repaired.

LINCOLNSHIRE, an English county, is bounded N. by the æstuary of the Humber, N.W. by Yorkshire, W. by Nottinghamshire, S.W. by Leicestershire and Rutlandshire, S. by Northamptonshire, S.E. by Cambridgeshire and Norfolk, and E. by the German Ocean. The greatest length N. to S. is 75 miles; the greatest breadth E. to W. is 52 miles. It is comprehended between 52° 39′ and 53° 45′ N. lat., and between 0° 22′ E. long. and 0° 57′ or 0° 58′ W. long. The area is 2611 square miles. The population in 1841 was 362,602.

Coast-line and Surface.—The coast, from the Welland to the Humber, forms a tolerably regular curve convex to the sea, and is low and marshy except about Clea Ness, near Grimsby, where the coast rises into cliffs. A belt of sand skirts the land, of varying breadth. From the mouth of the Welland to that of the Nene the coast is so low as to require the protection of a sea-wall or bank. The æstuary of the Wash is occupied for the most part by sand-banks, dry at low water. Between these banks the streams which flow into the æstuary have their channels; and two portions of deeper water, named Boston Deeps and Lynn Deeps, occur between the sand-banks.

A considerable part of Lincolnshire consists of alluvium, constituting a vast extent of flat or marsh land, from the border of which the subjacent strata rise and form comparatively elevated tracts. The alluvial soil occupies nearly the whole of the coast; and in some places it extends half across the width of the county.

From Barton-upon-Humber to Burgh, near

Wainfleet, a line of chalk downs extends, called the Wolds of Lincolnshire. These downs sink on the north and east beneath the alluvium described above. Along the coast north and south of Saltfleet are natural outlets of water called provincially 'blow wells,' deep circular pits, which furnish a continual flow of water, and are vulgarly reputed to be unfathomable; they are presumed to communicate with the chalk. The green-sand forms a narrow belt, skirting the chalk on the west side of the Wolds; and the iron-sand occupies a narrow belt adjacent to it. Westward of the iron-sand extends a wide flat, occupied mostly by the Oxford clay; this district forms a large central valley separating the Wolds, with the adjacent hills, from the higher grounds formed of the oolitic strata, which extend southward through the county from the marshes which line the Humber. These higher grounds form part of what have been termed the stonebrash hills, and separate the valleys of the Ancholme and the Lower Witham from those of the Trent and the Upper Witham. The remaining part of the county is occupied by the lias, except a little of the new red sandstone in the north-west corner.

Rivers; Canals; Railways.—The Trent, for about sixteen miles, separates the counties of Lincoln and Nottingham; from below Gainsborough to its junction with the Yorkshire Ouse, its course of nineteen miles is almost entirely within the border of Lincolnshire. This river is navigable throughout that part which belongs to this county. The Idle, the Bykerdike, and the Torne flow into the Trent. The Ancholme rises near Spridlington, and flows past Bishop Briggs to the Humber near Barton; there is a straight artificial cut of 20 miles, to aid the navigation. The Tetney is formed by two streams which rise near Market Rasen, and flows into the German Ocean between Grimsby and Saltfleet. The Ludd rises near the south-west escarpment of the chalk range; it is formed by the junction of two or three brooks which unite above Louth and flow north-east into the German Ocean by several arms. The Louth navigation consists partly of this river and partly of an artificial cut. The Withern flows into the German Ocean at Saltfleet. The Steeping enters the same sea at Spilsby.

South of Wainfleet the fen district commences: and, from the extensive system of draining that has been carried on, the hydrography of the county becomes very complicated. The rivers have in several places been diverted from their natural beds, and now flow in artificial channels in direct lines, and are connected with artificial cuts, which open a communication between rivers naturally unconnected.

The Witham, the most important river in the county, rises near the village of Thistleton, just within the border of Rutlandshire, and flows past Grantham, Lincoln, and Tattershall to Boston, below which town it flows into the Wash. The length of the Witham is about 80 miles, during the course of which it receives the waters of the Brant, Langworth, South Beck, Bain, Sleaford River, and the Waring, Scrivelsby, and Enderby Becks. Many of these minor streams are united by artificial cuts. The Welland rises in Northamptonshire, and flows past Stamford, Deeping, Crowland, whence there are two branches, the Old and New Welland, to the Wash. The Glen rises near Grantham, and flows into the Wash near the mouth of the Welland.

A general account of the great fen district of England, and of the changes which it has undergone, is given elsewhere. [Bedford Level.] The northern fens are described in Axholme. The artificial cuts or drains are very numerous; they are called by the several names of 'cuts,' drains,' 'leams,' 'droves,' 'becks,' 'eans,' and 'dykes.' The chief among them, in this county, are the Car Dyke, the South Forty-Foot, the North Forty-Foot, the East Fen Drain, the West Fen Drain, the Old and New Hammond Becks, and the Shire Drain.

Of navigable canals, beside the Ancholme, Louth, Horncastle, Sleaford, Bourn, and other navigations, there are only two. One of them, the Foss Dyke, is probably a Roman work, and appears to have been used for navigation previous to the Conquest. Henry I. had it cleaned out and the navigation improved. It extends from the Trent to the Witham. The other canal is the Stainforth and Keadby Canal, which connects the Trent with the Don.

When the works at present in course of construction are finished, Lincolnshire will be well supplied with railways. The Midland, the Great Northern, and the Sheffield and Lincolnshire Companies have very extensive lines through the county. The main lines of route will be Peterborough to Boston and Grimsby, Peterborough to Grantham and Newark, Newark to Gainsborough and Boston, Boston to Lincoln and Gainsborough, Newark to Lincoln and Caistor, Grantham to Boston and Spalding.

Soil and Agriculture.—The soil varies greatly in different districts. In some places it is rich and productive, and in others so poor as to weary the patience and industry of the most persevering. The grazing land in this county cannot be surpassed in its capabilities for fattening cattle; and some of the drained fens and warp-lands along the rivers possess a high degree of fertility when cultivated. Arthur Young divided the county thus:—

	Acres.
Of fen lands	776,960
Of loamy and sandy heaths, now mostly cultivated	118,400
Of wolds, chiefly chalk	234,880
Of various loams and sands of moderate quality	718,080
Making a total of . . .	1,848,320

The lands which have been reclaimed from the sea by banking and draining are mostly laid in large farms, which require a considerable capital. In other parts of the county there are many small properties, cultivated by the owners, and kept with great neatness. Fish is much used as a manure. Ground bones are used very abundantly on the light sands.

On the richest fen lands the most profitable rotation consists of the following crops:—1, Cole

fed off with sheep; 2, oats; 3, beans; 4, wheat; 5, clover; 6, wheat. In some heavy soils the Essex rotation is adopted:—1, fallow; 2, barley; 3, beans; 4, wheat; and this, alternated with the other, answers well on rich lands. For the poor sands there is no system so advantageous as that of raising turnips, and feeding sheep with them on the land where they grew.

There is some wood cultivated in the neighbourhood of Boston on rich warp-land; some sainfoin grown on the chalky soils, and lucern on the richer. Cabbages and carrots are cultivated to a considerable extent; the former on the heavy clays, and the latter on the light and deep sands.

The grass-lands of Lincolnshire are some of the best feeding lands in the kingdom. Some of the finest pastures are fed off by horses which are fatted for the markets; but horses soon deteriorate the grass, while sheep improve it. Very little hay is made in the county: the grass is mostly eaten in a green state.

One of the most effectual improvements on land by the side of some rivers in which the tide flows rapidly is that of warping; or, in other words, retaining the water on the land so long as to let it deposit a layer of sand and mud. The warping is effected by letting in the water of the rivers, which have a muddy current, by artificial channels and sluices, and retaining it there till low water. The river Humber carries off, in its course over various soils, all the finer particles which are too light to be immediately deposited. These consist of every kind of earth and portions of vegetable and animal matter, and are in such quantity that a layer one-tenth of an inch in thickness is often deposited between one tide and the next. Thus in a very short time a new soil is formed of any depth which may be desired, provided the land lies below the level of the river at high tides. Besides creating a soil, the warping fills up all inequalities, and a perfectly level surface is produced. The soil thus produced is of extreme fertility.

It has added much to the produce of Lincolnshire, that the crops raised on the warp-lands have enabled the farmer to employ all the manure made by the abundance of straw which these lands produce to improve the lands that lie above the reach of the waters. The best mode of treating warp-lands which are too high to admit of being warped over again is to lay them down to grass in a state of great fertility.

In a county which contains such rich pastures it is of great importance that the breed of cattle and sheep be of the most profitable kind; accordingly we find that no county possesses finer breeds of horses, oxen, and sheep. There are not many dairies in Lincolnshire: breeding and fattening are considered more profitable and less troublesome. There is however some excellent cheese made of the Stilton kind.

Divisions, Towns, &c.—Lincolnshire has long been divided into three 'parts,' as they are termed, Lindsey, Kesteven, and Holland. Lindsey is by far the largest, and comprehends all that part of the county which lies north-east of a line drawn from Clifton-upon-Trent to Lincoln, thence by the Witham to near Boston, and from just above that town to the sea between Boston and Wainfleet. The name Lindsey, like that of the county, is derived from Lindum, the Roman name of Lincoln. Kesteven comprehends the south-western part of the county. Holland comprehends the rest of the county, including the greater part of the fens. Lincolnshire is further divided into wapentakes, hundreds, and sokes. It is in the diocese of Lincoln. It is in the Midland Circuit, and the assizes are held in Lincoln. For parliamentary purposes the county is divided into North Lincolnshire and South Lincolnshire, each of which returns 2 members to parliament; besides which, the city of Lincoln, Stamford, Grantham, and Boston, return each 2 members, and Great Grimsby returns 1 member—total, 13 members.

The following are the principal towns, with the population of each in 1841:—

Alford is 22 miles N. by E. from Boston, and is situated near the head of a small stream which flows into the sea. The town consists chiefly of one street. Population of the parish, 1945.

Barton-upon-Humber, a market-town on the south side of the Humber, 33 miles N. by E. from Lincoln, is a place of considerable antiquity. At the time of the Norman Conquest it was one of the principal ports of the Humber. It is now the place where the northern road passes the Humber to Hull; and the improvements which have been made in the ferry have rendered it a considerable thoroughfare. The town contains two large churches, one of which is very ancient. A considerable trade in corn is carried on in the town; and bricks, tiles, ropes, and sacking are extensively manufactured. Population of the town, 3475.

Bolingbroke is a small market-town, 8 miles N. from Boston. There are a few remains of an ancient castle which belonged to John of Gaunt, from which his son Henry IV. took the surname of Henry of Bolingbroke. Population of the parish, 919.

Boston. [BOSTON.]

Bourn is a market-town, on the road from London to Lincoln, 36 miles S. by E. from Lincoln. The town consists chiefly of one long street of modern houses. In the centre of the market-place is an ancient town-hall, said to have been built by the great Lord Burghley, a native of the town. The church is large. Wool-stapling and tanning are carried on, and the town has some trade in leather and wool. There is a navigable canal communicating with the river Glen. Population of the parish, 3361.

Caistor, or *Castor*, is a small market-town, 23 miles N.N.E. from Lincoln.

Corby is 30 miles S. from Lincoln. Population of the parish, 714.

Crowland, or *Croyland*, is near the south border of the county, 42 miles S. by E. from Lincoln. Croyland Abbey was a rich monastic establishment. There are some remains of the church. The village is surrounded by fens. The market has been removed to Thorney. Population of the parish, 2973.

Deeping, distinguished as Market Deeping, is a

market-town, 40 miles S. by E. from Lincoln. The parish, including Deeping West, comprehends a population of 1525. Some trade is carried on by the Welland.

Donington is a market-town, 8 miles S. by E. from Boston. Population of the parish, 2026.

Falkingham, or *Folkingham*, is a market-town, 25 miles S. from Lincoln. Population of the parish, 820.

Gainsborough, an ancient market-town, is situated on the eastern bank of the Trent, 15 miles N.W. by N. from Lincoln. The town consists chiefly of one street running parallel with the river, which is here crossed by a substantial stone bridge. There is a town-hall, beneath which is the gaol. By means of the Trent, which falls into the Humber about 20 miles below the town, vessels of 200 tons' burthen can come up to the wharfs, and the town has inland communication by canals, and a railway extends from Gainsborough to Great Grimsby. Population of the town, 6948.

Grantham, a parliamentary borough and municipal borough, is situated on the west bank of the Witham, 23 miles S. by W. from Lincoln. The town is well paved and is lighted with gas. The church is a beautiful specimen of the Gothic architecture of the 13th century, with a spire which is much admired for its elegance and loftiness. There is a guild-hall, a gaol, a house of correction, and a free grammar-school founded in 1528. Grantham is connected with the Trent by means of a canal 30 miles long. The trade is chiefly in corn, malt, and coals. The municipal borough is governed by 4 aldermen and 12 councillors: population, 4683. The parliamentary borough returns two members: population, 8786.

Glanford-Brig is a market-town, 23 miles N. from Lincoln. The population of the town in 1848 is stated to have been 2600.

Grimsby, or *Great Grimsby*, a parliamentary borough and municipal borough, is situated on the south bank of the Humber, near its mouth, 31 miles N. by E. from Lincoln. The town consists of two parts: the older part of the town is irregularly laid out, and is at the head of the harbour, about a mile from the sea; the new part, commonly called 'the Marsh,' consists of three streets parallel to the harbour, on the east side. The harbour is at one of the mouths of the Laceby Beck. In April 1849, Prince Albert laid the foundation of new and extensive docks. The East Lincolnshire Railway now (May 1849) extends to Grimsby, and another line passes thence to Gainsborough. The municipal borough is governed by 4 aldermen and 12 councillors: population, 3700. The parliamentary borough returns 1 member: population, 6698.

Holbeach is a market-town, 12 miles S. by E. from Boston. The church is large and handsome. Population of the parish, 4637.

Horncastle is a market-town, 17 miles W. from Lincoln. The town has been much improved of late years, and contains many well-built houses. Part of the church is ancient. Corn and wool are the principal articles of commerce, which has been much promoted by opening the Horncastle navigation from this town to the Witham. Population of the parish, 4521.

Kirton (distinguished as Kirton in Lindsey, from another place of the same name in the parts of Holland) is a market-town, 17 miles N. by W. from Lincoln. Population of the parish, 1835.

Lincoln, the capital of Lincolnshire, a city and a county of a city, a municipal borough, and a parliamentary borough, is situated on the north bank of the Witham, 134 miles from London by the road. It was a place of considerable importance under the Romans, and also in the time of the Saxons.

The city is built on the southern slope and at the foot of a hill, on the summit of which is the cathedral. The town is irregularly laid out; the principal street is along the road from London to Barton-on-Humber, which extends right through the place, crossing the Witham by a bridge, and running up the hill on which the cathedral stands. This street also extends a considerable length south of the Witham. The most interesting of the public buildings is the cathedral, which has two transepts, a central tower at the intersection of the larger transept, and two western towers. It has been erected at different periods. The predominant style is the early English. The nave is very fine, and the piers in this part are peculiarly rich. The entire length, in the interior, is 482 feet, the height of the vaulting of the nave is 80 feet. The new bell, which is larger and heavier than the old bell called Tom of Lincoln, is 6 feet 10½ inches in diameter at the mouth, and weighs 5 tons 8 cwts.; the old one weighed nearly a ton less. There are 12 parish churches. The remains of the castle stand on the hill, west of the cathedral: they consist chiefly of the outer walls and the gateway tower. The site of the interior of the castle is occupied by the county gaol and court-house, which were rebuilt some years ago by Sir R. Smirke. The guild-hall is an ancient Gothic building. Lincoln abounds in monastic and other remains of ancient architecture. There are several ancient gateways, as the Chequer or Exchequer Gate in the Cathedral Close, and the Stonebow in the High Street. The remains of John of Gaunt's Palace, and of a building called John of Gaunt's Stables, present some interesting Norman and early English features.

The chief trade is in flour, and there are some extensive breweries noted for their ale. The county assizes have been held here.

The municipal borough is divided into 3 wards, and is governed by 6 aldermen and 18 councillors. Population of the city, 16,172. The parliamentary borough returns 2 members: population 13,411.

Louth, a market-town and municipal borough, is situated on the bank of the little river Ludd, 25 miles N.W. by W. from Lincoln. The church is one of the finest in the county; it has a lofty and elegant tower, surmounted by a spire. The Louth navigation extends from the town to the sea at the mouth of the æstuary of the Humber. The municipal borough is divided into 2 wards, and is governed by 6 aldermen and 18 councillors. Population of the parish, which is coincident with the borough, 8848.

Market-Rasen is a market-town, situated on a brook called the Rase or Raisin, which joins the Ancholme, 14 miles N.W. by N. from Lincoln. The Ancholme navigation begins here. Population of the parish, 2022.

Navenby, formerly a market-town, is 8 miles S. from Lincoln. The church is ancient, with a very fine east window. Population of the parish, 942.

Sleaford, called *New Sleaford*, to distinguish it from the adjacent village of Old Sleaford, is a market-town, situated on the little river Slea, 16 miles S. by E. from Lincoln. The town has been much improved of late years, and is well paved and drained. The church is large and handsome, with a tower surmounted by a lofty spire. The Sleaford Canal is cut from this town to the river Witham. Population of the parish, 3184.

Spalding, a market-town, is situated on the left bank of the river Welland, 15 miles S.W. by S. from Boston. The Welland is navigable for vessels of 60 or 70 tons up to the town. This town is in the fen district, but is well drained and clean. There is a town-hall, a gaol, a union workhouse, a small theatre, and a church with a fine tower and spire. Population of the parish, 7721.

Spilsby is a market-town, 15 miles N. by E. from Boston. There is a town-hall. The church is an irregular structure, with a handsome tower at the west end, of later date than the rest of the building. Population of the parish, 1444.

Stamford, a municipal borough and parliamentary borough, stands on the left bank of the river Welland, 40 miles S. from Lincoln. A stone bridge of five arches crosses the river, and connects Stamford with a suburb in the bordering county of Northampton. The town is ancient, and the streets are irregularly laid out, but are paved and lighted with gas, and most of the houses are built of freestone and covered with slate. The Welland is made navigable to the town for boats and small barges. There are five churches in Stamford, and one in the suburb on the right bank of the river. Most of the architecture of these churches is ancient, and some of it very fine. There are some interesting monastic remains in and near the town. There are a town-hall, gaol, theatre, infirmary, several places of worship for dissenters, and numerous schools. The Leicester and Peterborough Railway passes through Stamford. The municipal borough is divided into 2 wards, and is governed by 6 aldermen and 18 councillors: population, 6385. The parliamentary borough returns 2 members: population, 7384.

Swineshead is a small market-town, 6 miles W. by S. from Boston. The church is a handsome building. Population of the parish, 2079.

Tattershall, a market-town, is situated S. by E. on the little river Bain, just above its junction with the Witham, 11 miles N.W. from Boston. The town is much decayed. The Horncastle navigation passes through the town. Population, 607.

Wainfleet is a market-town, 14 miles N.E. from Boston. It is situated on a small creek in a marshy district. Population of the two parishes of Wainfleet All Saints and Wainfleet St. Mary, 2117.

History and Antiquities.—At the time of the Roman conquest Lincolnshire constituted part of the territory of the Coritani. In the division which the Romans made of Britain, Lincolnshire was included in the province of Flavia Cæsariensis.

Under the Saxons, Lindsey, a name which perhaps extended nearly or quite over the modern county of Lincoln, appears to have been a subordinate state dependent upon the kingdom of Mercia. Under the Danes Lincolnshire suffered greatly. The narrative of their ravages, given in the pages of the apocryphal Ingulphus, is interesting, and, if its authenticity could be depended on, would afford considerable light amid the historic darkness of the period. The county passed permanently into Danish hands about A.D. 877; it constituted part of the territory of the Danish burghs of Lincoln and Stamford; and was included within the boundary of the Danelagh (the Danish jurisdiction), as settled by the treaty between Alfred and Guthrun the Dane. In time however the Danish and Anglo-Saxon population became amalgamated, and the whole district came under the supremacy of the Anglo-Saxon crown.

In the civil war between Stephen and the Empress Maud Lincolnshire was the scene of contest. In the broils in which Henry II. was involved with his children, one of the Mowbrays, who had a castle in the Isle of Axholme, and was an adherent of the insurgent Prince Henry, was compelled to submit to the Lincolnshire men. In the civil war of the barons with John and his son Henry III., Lincoln was signalised by a second battle, which seated Henry III., yet a boy, securely on his throne. In the latter part of his reign, when troubles had again broken out, Axholme became once more the refuge of the disaffected. In the civil war of the Roses Lincolnshire appears not to have suffered much; but in the reign of Edward IV. an insurrection occurred in the county, in which the Lincolnshire men were defeated with great loss. At the time of the Reformation the Lincolnshire men again broke out into rebellion upon the suppression of the monasteries, A.D. 1536; but it was speedily suppressed.

In the civil war of Charles I. this county was the scene of several important events; engagements were fought, in 1642-3-4, at or near Grantham, Ancaster, Gainsborough, Horncastle, and Lincoln.

Of the ecclesiastical and baronial edifices which were erected between the Conquest and the Reformation, Lincolnshire contains many admirable specimens, especially churches. The cathedral of Lincoln, and the churches of Louth, Sleaford, and Spalding are among the principal.

Of monastic edifices there are several remains. Of Barling's Abbey part of a wall and some fragments of columns remain. Of Thornton Abbey, the gate-house, which formed the western entrance, is yet tolerably entire; four handsome hexagonal towers form the four angles of this gate-house. A spacious room, probably the refectory, and an adjoining room with recesses in both ends, the abbey church, and a portion of the octagonal chapter-house are also standing. Of Bardney Abbey, Kirkstead Abbey, Revesby Abbey, Haverholme

Priory, Temple Bruer, and Croyland Abbey, some portions remain.

LINDSAY, SIR DAVID, was born at Garmylton, in Haddingtonshire, about the end of the fifteenth century. He inherited from his father the estate of 'The Mount,' in Fifeshire, whence he is called Sir David Lindsay of the Mount. In the year 1512, he was appointed servitor, or gentleman usher, to the young prince of Scotland, afterwards James V. His duties seem to have been of the most servile kind,—he had not only to attend the person of the infant prince, but to have exercised the craft of nursing.

He is the authority on which his kinsman, Lindsay of Pitscottie, in his 'Chronicles of Scotland,' describes a spectral apparition which, in 1513, appeared to James IV. in the church of Linlithgow, and warned him against that campaign which terminated in the battle of Flodden. Sir David professed to have seen the apparition approach and vanish, and described him as 'ane man clad in a blue gown, beltit about him with a roll of linen cloth, a pair of bootikins on his feet to the great of his legs, with all other clothes conform thereto.'

The 'Dreme,' supposed to be the earliest of his writings, appeared in 1528. His other principal pieces are—'Complaint of the Papingo;' 'Complaint of John the Commonweil;' 'History of Squyer Meldrum;' 'The Monarchie;' and 'The Play, or Satire, on the Three Estates.' He particularly excelled in his attacks on the priesthood and the corruptions of the court; and after the Reformation his name was long popular as that of a Protestant champion. 'The Satire on the Three Estates' stands half way between the early 'Mysteries' and the dramas of the latter part of the sixteenth century. It was sometimes acted in the open air. Lindsay held the office of Lord Lyon King at Arms. In 1537 he had the task of preparing some masques or pageants to celebrate the arrival of Mary of Guise, queen of James V. The time of his death is not known, but he is said to have been alive in 1567.

LINDSEY, REV. THEOPHILUS, was born June 20, 1723. Lindsey entered St. John's College, Cambridge, in 1741; and, after taking his degrees, he was elected fellow in 1747, about which time he commenced his clerical duties at an episcopal chapel in Spital Square, London. About 1753 he was presented to the living of Kirkby Wiske, in the North Riding of Yorkshire; and in 1756 he removed to that of Piddletown, in Dorsetshire. In 1760 he married a step-daughter of his intimate friend Archdeacon Blackburn, and in 1763 he exchanged the living of Piddletown for that of Catterick. Before this removal Lindsey, who had felt some scruples respecting subscription to the Thirty-Nine Articles, began to entertain serious doubts concerning the Trinitarian doctrines of the offices of the Church of England. While contemplating the duty of resigning his living, Lindsey was induced to defer that step by an attempt which was made in 1771, by several clergymen, to obtain relief from parliament in the matter of subscription to the Thirty-Nine Articles, and in which he joined heartily, and a petition was drawn up and presented to parliament, but the prayer was rejected. He drew up, in July 1773, an 'Apology' for the step he was about to take, which was subsequently published. In the following December he resigned his connection with the Established Church, and, selling the greatest part of his library to meet his pecuniary exigencies, he proceeded to London. On the 17th of April he began to officiate in a room in Essex Street, Strand. Being very successful in his efforts to raise a Unitarian congregation, he was able shortly afterwards to commence the erection of a more permanent chapel in Essex Street, which was opened in 1778. In 1782, Dr. Disney became his colleague in the ministry at Essex Street, and in 1793, in consequence of his infirmities, he resigned his ministerial duties entirely into the hands of Dr. Disney. He died Nov. 3, 1808, in his 86th year. He wrote several works in support of his religious views, and two volumes of his sermons were published shortly after his death.

LINE. [Solid, Surface, Line, Point.]

LINE. The French used to divide their inch into twelve lines, and the line into twelve points, which measures are out of date, since in all scientific investigations the metrical system is adopted. Sometimes, but rarely, the line has been divided into ten points, thus giving 1440 points to the foot: the French metrological writers, particularly the older ones, frequently give the measures of other countries in 1440ths of their own foot. Some English writers have divided the inch into lines. The French line is .0888 of an English inch, and is also two millimetres and a quarter.

LINES OF INTRENCHMENT are the parapets executed by an army in the field, for its protection, when it is to remain for a time on the defensive. In many cases the protection of an army consists merely of the natural obstacles of the country, as escarpments, rivers, and marshes; but, where these are wanting, and occasionally with them, there is formed a continuous breast-work, consisting of redans as C C, fig. 1, joined by curtains, as *a b*. The distances of the redans, from centre

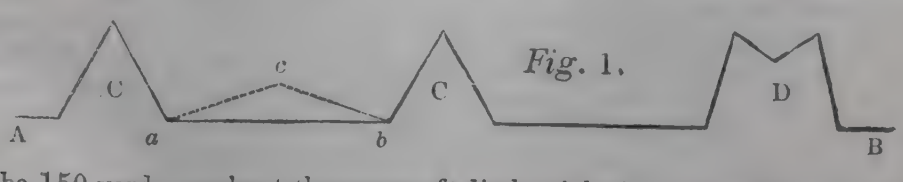

Fig. 1.

to centre, may be 150 yards, or about the range of musket-shot: such was the construction recommended by Vauban, which, since his time, has been modified by giving to the curtains the form indicated by the lines *a c*, *b c*, in order that the ditch might be more effectually defended from the faces of the redans. These may have the form of equilateral triangles, and the lengths of their sides may be about 50 yards. The entrances are usually in the middle of the curtains.

Instead of simple redans parts of the line have occasionally been formed of works resembling two united together, as D.

These lines are considered advantageous for the protection of a frontier, to prevent the enemy's marauding parties from making inroads for the purpose of levying contributions or laying waste the country.

When it is intended to defend a bank of a river, or a side of a road, the parapets may consist of a series of branches in the form *a b c d*, fig. 2.

Fig. 2.

A line of this kind is said to be *à crémaillères;* and in such situations a succession of fires from the branches *a b*, *c d*, &c., may be directed against the enemy during his advance. The distances between the salient points *b*, *d*, &c., should not exceed one hundred yards, and the lengths of the short branches may be about 18 or 20 yards.

It may be added also, that the line *à crémaillères* (indented line) would be convenient when the descent of a hill is in its direction, as from *a* to *e*; for then, the enemy being supposed to occupy the ground in front of *a b*, the short branches could be easily raised high enough to defilade those which, as *b c*, *d e*, &c., tend towards the foot of the hill.

The most perfect fortification for defending a line of country presenting few natural obstacles to the advance of an enemy, should the importance of the position render it advisable to incur the labour of the construction, would be a series of bastions connected by curtains, either straight or broken. The distance from the centre of one bastion to that of the next may be 180 yards.

Lines of intrenchment composed of works placed at intervals from one another, provided the distances be not so great as to prevent the troops in them from mutually assisting each other, have great advantages over those formed of continuous lines of parapet. In the latter case it is scarcely possible for the army to make a movement for the purpose of attacking the enemy, however favourable the opportunity, since much time would be lost in issuing from the line through the narrow passages. Detached works, on the other hand, constitute a number of strong points by which the position of the army is secured, while through the spacious intervals an advance or retreat may take place with all necessary facility. It may be added, that detached works are capable of being easily adapted to any kind of ground; for it is merely necessary to place them on the more elevated spots in such situations that the enemy may not be able to penetrate between them without being exposed to their fire. [ENCAMPMENT, col. 823.]

All the works which have been described consist of parapets formed of earth obtained by cutting a ditch in front.

LINKOPING. [SWEDEN.]

LINLEY, THOMAS, was born at Wells, about the year 1725. He was first the pupil of Chilcot, organist of the abbey, Bath, and finished his studies under Paradies, an eminent Venetian, who had become a resident in this country. Mr. Linley established himself at Bath, where his concerts, supported by the vocal abilities of his two daughters, Eliza and Mary, afterwards Mrs. Sheridan and Mrs. Tickell, were very attractive. He joined with Mr. Stanley, and afterwards with Dr. Arnold, in conducting the London oratorios. In 1775 he set the music to Sheridan's opera 'The Duenna,' which had great success. He next purchased a large share in Drury Lane Theatre in 1775, and in connection with that theatre produced his 'Carnival of Venice;' 'Selima and Azor,' from the French; and 'The Camp.' He also added those charming accompaniments to the airs in 'The Beggar's Opera,' which are still in use. His Six Elegies, Twelve Ballads, and Madrigal 'Let me careless and unthoughtful lying,'—were among the most popular of his musical productions. Linley's management of the theatre was generally successful.

Mr. Linley survived his two accomplished daughters and several of his other children. His end was hastened by the sudden death of his eldest son Thomas, a young musician of very promising talents. Mr. Linley died in 1795, leaving a widow, a daughter, and two sons, of whom

LINLEY, WILLIAM, born about the year 1767, was the younger. Having been well educated, and placed in easy circumstances, he devoted most of his attention to music. He produced a considerable number of glees, all of them evincing great originality of thought and refined taste. He composed a set of songs, two sets of Canzonets, two comic operas, and many detached pieces; he compiled the 'Dramatic Songs of Shakspere,' and wrote two novels and several short pieces of poetry. He died in 1835.

LINLITHGOWSHIRE, or WEST LOTHIAN, a county of Scotland, is bounded N. by the Frith of Forth, W., S.W., and N.W. by Stirlingshire and Lanarkshire, and S. and S.E. by Edinburghshire, from which it is separated by the rivers Breich and Amond. It lies between 55° 49′ and 56° 1′ N. lat., and 3° 18′ and 3° 51′ W. long. Its greatest length is nearly 21 miles, and its greatest breadth somewhat exceeds 10 miles. The area is 112 square miles. The population in 1841 was 26,872.

The centre of Linlithgowshire consists of a somewhat elevated plateau, surrounded on all sides by hills, of which the highest are in the south-west, and attain an elevation of about 1400 feet. Coal is abundant, and several valuable seams are wrought. Limestone and freestone are quarried. The soils are generally strong, and are well drained, and well manured with lime and farm-yard dung.

The county returns one member to parliament, and Linlithgow and Queensferry are each contributory to a parliamentary district.

Bathgate, a market-town, is 6 miles S. by W. from Linlithgow. It is a burgh of barony, and is governed by a provost, 3 baillies, and 12 councillors. The principal streets are lighted with

gas, and the town contained in 1841 a population of 2809.

Borrowstownness, commonly written and pronounced Bo'ness, a burgh of barony, is situated on a point of land, or *ness*, which projects into the Frith of Forth, 3 miles N. from Linlithgow. The town is close to the harbour, which is formed by two piers carried out into the Frith, and is very safe and convenient, with 16 or 17 feet of water at spring tides. The town was very flourishing, and the port had a large commerce till the opening of the Forth and Clyde Canal, and the erection of Grangemouth, in Stirlingshire, into a separate port, since which time the commerce of Borrowstownness has decreased considerably. The population of the parish in 1841 was 2347, nearly all of whom were in the town.

Linlithgow, the county town, is a royal burgh, and a place of great antiquity. It is 17 miles W. by N. from Edinburgh. The town is situated on the south side of Linlithgow Loch, which is a mile long, and about a quarter of a mile in the widest part. The town consists chiefly of one long street, and contains the county buildings and a town-house. It is lighted with gas, and well supplied with water, and is governed by a council of 27 members, including the provost and 4 baillies. The Edinburgh and Glasgow Railway passes through Linlithgow. It is included in the Falkirk parliamentary district. The population of the burgh in 1841 was 3872. The remains of the royal palace of Linlithgow stand on an eminence which projects into Linlithgow Loch, and divides it into two nearly equal parts. James IV., James V., and James VI. frequently resided in the palace. It was set on fire in 1746, but several of the rooms are yet entire.

Queensferry is a small town and port on the south side of the Frith of Forth, with a population of 721. It is included in the Stirling parliamentary district.

LINNÆUS, or VON LINNE', KARL, was born at Råshult, in the province of Smäland, in Sweden, May 4, 1707. His father was a country clergyman.

In 1727 Linnæus went to the university of Lund in order to study medicine, and was so fortunate as to be received into the house of Dr. Stobæus, a physician possessing a fine library and a considerable knowledge of natural history. In 1728 he passed the vacation at home, and there formed the resolution of prosecuting his studies at Upsal. To meet the expenses of his academical education, his father was unable to allow him a larger sum than 8*l.* sterling; he consequently suffered much privation, and in vain endeavoured to increase his income by procuring private pupils. His circumstances however were somewhat improved by a royal scholarship awarded him on the 16th of Dec., 1728. He diligently persevered in attendance upon the courses of lectures connected with his future profession—the more diligently perhaps because of his poverty; and by the end of 1729 the clouds of adversity began to disperse. By this time he had become known to Dr. Olaus Celsius, the professor of divinity at Upsal, who was glad to avail himself of the assistance of Linnæus in preparing a work illustrating the plant mentioned in the Holy Scriptures. His ne friend procured him private pupils, and introduce him to the acquaintance of Rudbeck, the pr fessor of botany, then growing old, who ap pointed him his deputy lecturer, took him into h house as a tutor to his younger children, and gav him free access to a very fine library and colle tion of drawings.

Here he began to sketch those works, whic were afterwards published under the titles ' Bibliotheca Botanica,' 'Classes Plantarum 'Critica Botanica,' and 'Genera Plantarum,' an perceived the importance of reducing into brevit and order the unmethodical, barbarous, confuse and prolix writings with which he was su rounded. In the year 1731 Linnæus quitted th house of Rudbeck, and on the 12th of Ma 1732, proceeded, under royal authority and the expense of the university of Upsal, upon h journey into Lapland. The result of this journe was his 'Flora Lapponica.' In the beginning 1735 he set out upon his travels in search some university where he could obtain the degr of doctor in medicine at the least expense, in ord that he might be able to practise physic for livelihood. He accomplished his purpose Harderwijk, in Holland, June 23, 1735.

In Holland Linnæus formed a friendship wi Dr. John Burmann, professor of botany at A sterdam, and it was during his stay of so months with that botanist that he printed h 'Fundamenta Botanica,' a small octavo of thirt six pages, which is one of the most philosophic of his writings. At that time he was introduc to Mr. Cliffort, a wealthy Dutch banker, w possessed a fine garden and library at a pla called Hartecamp. This gentleman engaged Li næus to put in order the objects of natural histo contained in his museum, and in examining a arranging the plants in his garden and herb rium; and he was also occupied at the same ti in passing through the press the 'Flora La ponica,' 'Genera Plantarum,' 'Critica Botanic and some other works, and in the publication the 'Hortus Cliffortianus,' a fine book in fol full of the learning of the day, ornamented wi plates, and executed at the cost of Mr. Cliffo It was during his engagement at Hartecamp th he visited England, where he seems to have be ill received by Dillenius, at that time professor botany at Oxford, who was offended at liberties Linnæus had taken with some of genera; but the quarrel was made up before return to Holland. Towards the end of 1737 quitted Mr. Cliffort, but did not leave Holla till the spring of 1738.

On his return to Sweden he commenced pract in Stockholm as a physician, and with the aid a pension of 200 ducats from the government, condition of lecturing publicly in botany mineralogy, his prospects for the future became satisfactory as to enable him to marry at Midsu mer 1739. By this time his botanical fame spread over all Europe, and from this time wards the life of Linnæus was one of increas fame and prosperity. Every branch of nat

history was revised or remodelled by him; books and collections were sent to him from all parts of the world; his pupils Hasselquist, Osbeck, Sparmann, Thunberg, Kalm, Lofling, and others, communicated to him the result of their travels in Europe, Asia, Africa, and America. He was named professor of medicine at Upsal in 1740, and afterwards of botany; in 1746 he received the rank and title of archiater; in 1757 he was raised to the nobility, and took the title of Von Linné, and by the year 1758 he was able to purchase the estates of Hammarley and Söfja for 80,000 Swedish dollars, above 2330*l.* sterling.

During these eighteen years his life was one of incessant labour; besides his practice as a physician, which was extensive and lucrative, and his duties as professor, he published a most extraordinary number of works on various branches of natural history. In addition to a large number of dissertations bearing the names of his pupils, the 'Flora,' and 'Fauna Suecica,' 'Materia Medica,' edition after edition of the 'Systema Naturæ,' and numerous miscellaneous works, some of great importance, he produced his 'Philosophia Botanica,' and 'Species Plantarum.'

Towards the latter part of his life Linnæus suffered severely in health. He died Jan. 10, 1778, and was buried in the cathedral at Upsal.

After the death of the son of Linnæus his library and herbarium were purchased for the sum of 1000*l.* by the late Sir James Edward (then Dr.) Smith, and are now in the possession of the Linnæan Society of London. The herbarium, contained in three small cases, is in good condition, and forms a most curious botanical antiquity, of great value, as the means of ascertaining with certainty the synonyms of the writings of Linnæus.

LINNET, the name of a hard-billed singing bird, which, though well known under one or the other of its various appellations to every English bird-catcher, has, in consequence of the changes of its plumage, and the names applied to it when it appears under those changes, given rise to much confusion in our systems and catalogues, leading both the learned and the unlearned into considerable error.

As synonyms of the Linnet or Common Linnet, we have the Greater Red-Headed Linnet, the Greater Redpole, the Rose Linnet, the Gray Linnet, the Brown Linnet; *Fringilla Linota*, Gmel.; *F. Cannabina*, Gmel.; *Linaria rubra major*, Briss.; *Linaria Cannabina*, Swainson, and modern authors. According to M. Temminck this bird is subject to accidental variation of plumage, from the natural colour even to pure white, or whitish with faint markings; sometimes the plumage is variegated with white, sometimes the general colour is dusky black, the feet being often red. We need not here enter into any long account of the plumage of a bird so well known; yet it may be as well to state that the adult male in spring is thus characterised:—Feathers of the forehead and the breast of a crimson red, terminated by a narrow border of rosy red; throat and front of the neck whitish, with longitudinal brown markings; top of the head, nape and sides of the neck, of a pure ash; back, scapulars, and wing-coverts, chestnut brown; under parts whitish; some of the quills blackish, bordered externally with white; tail forked, black. Caged birds do not acquire the roseate tints in spring which adorn the plumage of the free birds. After the breeding season, the roseate tints begin to fade, and gray and brown prevail.

The Linnet is spread over Europe generally, and is abundant in England. It resorts to wild commons, and hedges of furze, building its nest in a low bush; the eggs are blueish white, dotted with purplish red. In winter linnets assemble in flocks, visiting the sea-coasts till spring calls them to return to the uplands, when they separate and pair. Their food consists of small seeds generally, as of the flax, thistle, dandelion, &c., and particularly of those of the cruciform plants. The song of the Linnet, though short, possesses much sweetness, and hence this bird is very commonly kept in cages.

Besides the Common Linnet, the genus *Linaria* contains two other British species, viz. the Mountain Linnet or Twite (*L. montana*), and the Redpole or Lesser Redpole Linnet (*L. minor*). (See Willughby, Bechstein, Temminck, Selby, Gould, Yarrell, Bewick, and the works of other ornithologists.) [FRINGILLIDÆ, GREENFINCH.]

LINSEED, the seed of *Linum usitatissimum*, or Flax plant, contains a mealy albumen of so oleaginous a nature that it yields by pressure in great abundance the oil of linseed. The seed of the flax-plant is harvested, not merely with a view to the reproduction of the plant, but also because of the oil which it yields by compression. For both these purposes, of sowing and crushing, linseed is largely imported into the United Kingdom. Linseed is also much used as food for small birds. The quantity imported during 1848 was 796,013 qrs., principally from Russia. Some of this seed goes to Ireland, and is chiefly used for sowing. The best seed for this purpose is brought from Holland. The residuum of linseed from which the oil has been expressed is used, under the name of oil-cake, for fattening cattle.

LINSEED OIL may be procured by cold expression of the seeds, a process which makes the oil clearer; or the bruised seeds are roasted in the oil mills, in which case it is brownish yellow, and easily becomes rancid, probably from attracting oxygen. Linseed oil is pellucid, with a faint but peculiar odour and taste. Specific gravity, 0.93. By long boiling it becomes dark brown, tenacious, and thickened, but dries more easily, and in this state is used for printer's ink; by still longer boiling it becomes black, almost solid, and elastically tenacious, like caoutchouc, and in this state it serves for bird-lime.

Linseed-oil is used to form liniments, of which the most common is that with lime-water, as an application to burns. But it is much more extensively used in the arts, particularly for painting.

LINTON. [CAMBRIDGESHIRE.]

LINUM, a genus of plants which gives its name to the small family of *Linaceæ*. The species are chiefly found in Europe and the north of Africa, but a few likewise in other parts

of the world. Few however are of any importance, except that which has been an object of culture from the earliest times of which we have any record, that is, *Linum usitatissimum*, or the flax-plant, which is valuable as well for its seed as for the ligneous fibre of its cortical layer, which forms the tow spun into yarn and woven into linen cloth. [FLAX, where the plant is erroneously stated to be the *Linum perenne*.]

The seeds of *Linum usitatissimum* yield several articles useful in medicine and surgery. The testa, or husk of the seeds, is very mucilaginous, the kernel contains much oil, and the farina or meal procured by grinding or bruising the seeds, after the oil has been expressed, furnishes an excellent material for poultices.

LINZ, the capital of Upper Austria, is situated in 48° 19′ N. lat., and 14° 17′ E. long., on the right bank of the Danube, over which there is a wooden bridge 864 feet long, leading to the suburb Urfahr. The old town consists of one long street, and is of much less extent than the suburbs. There are four gates and three squares. Linz is, on the whole, a well-built city. There are 7 churches, the largest of which is the cathedral. Other remarkable buildings are,—the government-house; the hall, in which the provincial parliament meets; the town-hall, built in 1414; the city brewery, the custom-house, the gymnasium, the theatre, and the great imperial manufactory of woollen cloths and carpets. Linz gives title to a bishop, and has a lyceum, with a library of 25,000 volumes, several public schools, a deaf and dumb asylum, and many charitable institutions. There are considerable manufactures of calico, dimity, leather, gunpowder, &c. The population of the town and suburbs is 25,000. It is a place of considerable trade, which the railroad that runs N. to Budweis and S. to Gmünden, and the steam navigation of the Danube have greatly increased. The fortifications of Linz, lately constructed on a new plan by Prince Maximilian d'Este, consist of a series of 32 detached forts, 23 on the right bank and 9 on the left bank of the Danube, each at a distance of from 1 mile to 3 miles from the town, round which they form a circuit of 9 miles, being joined to each other by a covered way. The town and neighbourhood of Linz are celebrated for attractive beauty of scenery. Steamers ply regularly to Vienna, and in summer up the river to Passau and Ratisbon.

LION, Λέων and Λέαινα, Lion and Lioness of the Greeks; *Leo*, *Lea*, and *Leœna* of the Romans; *Leone* and *Leonessa* of the Italians; *Lion* and *Lionne* of the French; *Löwe* and *Löwinn* of the Germans.

The Lion is the largest and most formidable of the existing species of the Cat-tribe [FELIDÆ]. The neck and shoulders of the male are, as a general rule, ornamented with a shaggy mane, and the tale is tufted at the end. The female has no mane. The colour of the Lion is uniformly tawny, varying in intensity almost to brown; but the young are obscurely striped or brindled. The lion, divided into several varieties, is at the present day confined to Africa, Arabia, India, Persia, and the borders of the Euphrates. Formerly this ferocious animal was common in Egypt and Syria; and not only so, but also in several portions of eastern Europe. (See Herodotus, vii. 125–6, for an account of the destruction of the camels of Xerxes, in Pæonia, &c.)

Of the African Lions the following varieties are recorded by Lesson :—

1. *The Lion of Barbary.*—This lion has a deep yellowish brown fur, and the mane of the male is very much developed.

African Lion (Barbary).

2. *The Lion of Senegal,*—characterised by fur of a more yellow tint; the mane in the male being less thick, and nearly wanting upon the breast and insides of the legs.

3. *The Cape Lion,*—of which there are two races—one yellowish and the other brown; the latter is regarded as the most formidable. The Dutch colonists speak of the *blue* and *black* kinds, and it seems indeed that there is a black-maned lion, one of which, accompanied by his lioness, Mr. Burchell encountered in his travels in Africa.

The lion is not 'king of the forest,' but of wide plains and karroos, interspersed with tracts of brushwood, as well as the borders of rivers. During the day he usually slumbers in his retreat, rousing up from his lair as night sets in, and prowling during the hours of darkness in quest of food. The larger herbivorous animals fall before him, and the horse and the ox of the settler too often become his prey; nor is man always safe from his attack, although experience has taught this fierce brute the deadly nature of fire-arms. Many astonishing details proving the enormous strength of the lion, many thrilling accounts of hair-breadth escapes, and of exciting yet fearful lion-hunts, are on record; but we have not space for such narratives, and therefore refer to the works of various travellers in Africa, as Le Vaillant, Sparrman, Burchell, Steedman, Messrs. Schoon, McLuckie, in 'South African Journal,' Sept. 1830, and others.

Of the Asiatic Lions, three varieties appear to be well ascertained :—

1. *The Bengal Lion.*—Mr. Bennett points out the characteristics by which the Asiatic race is distinguished from that of Southern Africa, as consisting principally in the larger size, the more regular and graceful form, the generally darker colour, and the less extensive mane of the African. He gives a beautiful cut of the Bengal Lion, executed by Harvey, in the 'Tower Menagerie,' from a very fine specimen, little more than five years old, then in that collection. The development of the mane is very striking.

2. *The Persian* or *Arabian Lion.*—This is stated to be distinguishable by the pale Isabella colour of the fur; and those which have been exhibited in England as Persian Lions certainly bear out this remark; but Captain Smee, to whose interesting paper we shall presently have to call attention, observes that the Persian Lion exhibited at the Surrey Zoological Gardens seemed to him to differ but little from individuals known to be brought from Africa.

3. *The Maneless Lion of Guzerat.*—The ancients (Pliny, viii. 16) evidently were acquainted with a maneless variety of lion in Arabia and Persia, and Olivier ('Voyage dans l'Empire Othoman, l'Egypte, et la Perse,' tome iv.) enters into details relative to a maneless lion of Arabia and the country around Bagdad. Still nothing very definite was known respecting this variety. In December 1833, Captain Walter Smee exhibited to a meeting of the Zoological Society of London the skins of a lion and lioness killed by him in Guzerat, and selected from eleven obtained there by him, eight of which he had brought to this country. This lion, he stated, is distinguished from those previously known by the comparative absence of a mane from the sides of the neck and shoulders, the middle line of the back of the neck being alone furnished with longer hairs, which are erect, like those in the same situation in the *Cheetah* (*Felis jubata*). The under surface of the neck has long, loose, silky hairs, and there is a tuft at the angle of the anterior legs. Besides the absence of the extensive mane, the tail is shorter than that of ordinary lions, and is furnished at its tip with a much larger tuft or brush. In this tuft there existed, in the oldest of Captain Smee's lions, subsequently to the arrival of the skins in England, a short horny nail or claw, similar in form to, but somewhat larger in size, than that described by Mr. Woods in the 'Zool. Proceeds.,' 1832. The ancients believed that the lion lashed himself into fury with his tail, this claw acting as an additional stimulus,—an opinion destitute of solid foundation.

For an account of the habits and manners of the daring lion of Guzerat, and various interesting remarks, we refer to Captain Smee's paper in the 'Zool. Proceeds.,' 1833; and also to the 'Zool. Trans.,' vol. i., where an excellent figure is given.

The habits of the Asiatic lions do not differ much from those of Africa, excepting that the former, from the state of the country, frequent the jungles. In India the elephant is generally employed in the chase; and, in the accounts of most modern sportsmen in Asia, the great courage of the lion is particularly noticed. One of them states that the lions in India, instead of running away when pursued through a jungle, seldom take to cover as a refuge at all, but boldly face their foes, and have been known to bring elephant and rider to the ground. The tiger shrinks from exposing himself.

Reproduction and Length of Life.—The lioness is said to go with young five months, and generally produces two or three at a litter, which are born blind. The age to which the lion naturally lives is doubtful; it is generally supposed to be 20 or 22 years. If however the assertion is to be relied on, Pompey, the great lion which died in the Tower in 1760, was above 70 years of age, and another from the Gambia is stated to have attained the age of 63. Hybrids have been produced in confinement between the lion and tigress.

In the 'Proceeds. Zool. Soc.,' 1834, an interesting paper will be found on the comparative differences between the skulls of the lion and tiger, by Professor Owen.

There is in America a large feline animal called the *Puma* or *American Lion* (*Felis concolor*). The uniformity of colour in this great cat, combined with its ferocity, were probably the reasons which induced the early travellers in America, to whom accounts of its destructiveness were detailed, and who perhaps caught hasty glimpses of it, not unaccompanied with terror, to state that there were lions in America; and, though it was not long before the error was rectified, the term 'American Lion' is continued.—(See Hernandez, 1651, Ed. Romæ.)

This animal is called, in various languages of America, *Puma*, *Cuguacuara*, *Cuguacurana*, &c.; hence the French, *Couguar*. The Anglo-Americans term it *Panther*, or corruptly, *Painter*.

Puma (*Felis concolor*).

Description.—Adult Male. No mane. Silvery fawn above, sometimes reddish, the tawny hairs of the upper parts whitish at the tips; nearly white beneath, and on the inside of the limbs; whitish on the throat, chin, and upper lip. Head black and gray irregularly mixed; ears on the outside, and particularly at their base, sides of the muzzle whence the whiskers spring, and end

of the tail (which has no tuft), black. Length from nose to tail about four feet; tail rather more than two.

Female coloured like the male. Head small when compared with his.

Young.—Back marked with three chains of spots, which are generally of a blackish brown; dispersed spots or markings on the neck, shoulders, and sides. As the animal advances in age, these markings become more and more obscure, till they are at last lost in the uniform colour.

For an account of the anatomy of the Puma, see 'Proceeds. Zool. Soc.,' 1833.

Geographical Distribution.—North and South America. There is reason to think that it was formerly to be found from Canada to Patagonia, with an extensive range to the east and west, but its geographical area has been very much diminished, and is daily becoming more and more contracted before that civilisation which is in our own time obliterating more species than one. Mr. Washington Irving ('Astoria') mentions it as being about the mouth of the Columbia River.

The Puma is insidious and ferocious, and when wounded becomes very dangerous to the hunter. It is said to commit wholesale havoc; for, when it meets with a herd of animals, it will slay in all directions, sucking only a small portion of blood from each victim. To sheep, fifty of which it is said to have been known to kill in one night, it is most destructive, and the squatter well knows the ravages that it will make among his hogs. Though an expert climber, it is said to haunt in South America the marshy meadow lands bordering on the rivers rather than the forest. In the Pampas it must affect the comparatively open country; for there it is commonly taken by the lasso. In the northern districts the swamps and prairies are its principal haunts; and its prey, where flocks and herds are not, deer principally, upon which it is said to drop in the manner described by Charlevoix with regard to the elk.

The reader must bear in mind that there is another cat of a uniform colour, *Felis unicolor*, Traill, which is said to inhabit the forests of Demerara, and is one-half less than the Puma. The *Black Couguar*, *Felis discolor*, is allowed by some zoologists, and rejected by others.

Fossil Lions.—Remains of the *Felis Spelæa* of Goldfuss, *Höhlenlöwe*, or Lion of the Caves, have been found in the caverns of Franconia, &c. Four great fossil cats, as large as the lion, are enumerated by Professor Kaup as belonging to the Eppelsheim Sand.

LI'PARI ISLANDS, the ancient Æoliæ Insulæ, or Liparæan Islands, are situated between Calabria and the northern coast of Sicily, and between 38° 20′ and 38° 50′ N. lat., and 14° 10′ and 15° 13′ E. long. They are mentioned by the ancient geographers as seven in number. Stróngyle (now Stromboli); Lípara, now Lipari; Hiera, or Vulcania, now Vulcano; Dídyme, now Saline; Phœnicódes, now Felicudi; Ericódes, now Alicudi; and lastly Euónymos, supposed to be either Liscabianca or Panaria. There are several other smaller islands, or rather rocks, such as Liscanera, Basiluzza, &c., which belong to the same group, but are uninhabited and barren. *Stromboli* consists of a volcanic conical mountain nearly 3000 feet high. It rises abruptly from the sea, except on the N.E., where it has a cultivated space between it and the sea, which produces cotton and some wine, and is inhabited by about 300 people. The island is about 12 miles in circuit. The flames of the crater are a constant light to the sailors in that sea. *Panaria* is an extinct volcano, the crater of which slopes on one side to the seashore; the bottom or funnel of it is cultivated by a few individuals who are also fishermen. *Lipari*, the largest and most important island in the group, is a bishop's see, and the residence of a military governor; it is about 20 miles in circumference, and contains about 12,500 inhabitants. It has several mountains with volcanic craters now extinct: it also contains mineral springs, and abundance of volcanic products. The land, which is very fertile, produces cotton, olives, grapes, and the 'Malvasia di Lipari' wine. The town of Lipari, which has a harbour, is on the eastern coast of the island; it contains a castle, several churches, and some remains of antiquity. Lipari belonged successively to the Greeks, the Carthaginians, and the Romans. *Vulcano* is a barren deserted island, with a nearly extinct volcano. *Saline*, 16 miles in circumference, with several villages, and about 4000 inhabitants, consists of two mountains separated by a deep and very fertile valley. *Felicudi*, about 10 miles in circumference, with a few hundred inhabitants, produces corn, fruits and wine. *Alicudi*, the most western of the Lipari group, is hilly and not very productive, has some pastures, and about 200 inhabitants. The islands belong to Sicily.

LIPPE, River. [RHINE.]

LIPPE, a German principality which takes its name from the river Lippe, a feeder of the Rhine, is now divided into *Lippe-Detmold* and *Schaumburg-Lippe*, from the names of the two branches into which the ancient house of Lippe is divided.

Lippe-Detmold, consisting of the counties of Lippe and Sternberg, and part of that of Schwalenberg, forms a compact territory, bounded E. by Hanover, N.E. by Hesse Cassel, and on the other points by Prussia. The small bailiwick of Lipperode, with the town of Lippstadt, lies detached, being entirely surrounded by Westphalia. The area of the principality is 435 square miles, and the population 76,730. The country is mountainous, but well wooded. The Weser, the only navigable river, just touches the northern frontier of the principality for a short distance, and receives the Emmer, the Exter, the Werra, the Bega, and some other small streams. The Ems rises in a branch of the Osning or Teutobergerwald Mountains, which run through the territory from S.E. to N.W., and soon enters the province of Westphalia. The Lippe merely touches the bailiwick of Lipperode and the town of Lippstadt. Vast forests of oak, beech, and other timber, clothe the higher parts of the mountains, while on the slopes there is the finest arable land. The climate is temperate, but the air is frequently loaded with fogs. The winter is cold and wet; the summer very hot. The chief crops are corn, flax, hemp, potatoes, rape seed, garden vegetables, and timber.

The mineral products are plaster of Paris, lime, clay, marble, and freestone; and there is a salt-spring from which 36,000 bushels of salt are annually obtained. The breed of horned cattle is good; that of sheep has been much improved of late years. Swine and goats are numerous. The horses are good. The only manufactures of any importance are linen and linen-yarn.

Detmold, the capital, situated on the Werra, consists of the old and new town, and has among its chief buildings a palace, gymnasium, and theatre. The inhabitants number 2800. *Lemgo* on the Bega, a walled town with seven gates, has 4000 inhabitants, who manufacture woollen cloth, linen, leather, and tobacco-pipes.

Schauenburg-Lippe, or *Schaumburg-Lippe*, consists of 4 bailiwicks in the county of Schauenburg and 3 in the county of Lippe, which are surrounded by Hanover, the Hessian part of Schauenberg, Lippe-Detmold, and Westphalia. It is 210 square miles in extent, and has a population of 27,600. The country is mountainous; its products are similar to those of Lippe-Detmold; but, in addition, it has coal. The chief town and residence of the prince is *Bückeburg* on the Aue, which has a population of 2427.

LIPPI, FRA FILIPPO, was born at Florence in 1412. When he was eight years old, he was placed in the Carmelite convent Del Carmine, to commence his novitiate. Filippo himself gave early evidence of his extraordinary ability in art by a fresco of the papal confirmation of the rules of the order of the Carmelites; he executed also several other works in various parts of the convent and in the church Del Carmine, each work superior to his preceding effort, and so like those of Masaccio that his spirit was said to have passed into Filippo. All these works however, or at least what remained of them, were destroyed in the conflagration of the church in 1771.

In 1430, or when only seventeen years of age, Filippo gave up the monastic life, and went to Ancona. Here, while on an excursion of pleasure at sea, he was captured by a pirate, and carried in chains to Africa, and there sold as a slave. Eighteen months after he amused himself one day with drawing from memory his master's portrait in chalk upon a white wall. The performance so pleased his master, that he immediately released Filippo, and, after he had employed him to execute various pictures for him, sent him back safe to Italy. Filippo was landed in Naples, where he remained only a few months, and then returned to Florence. One of the first works which he executed at this time was a small picture of the Adoration of the Madonna, for the wife of Cosmo de' Medici, which is now in the Imperial Gallery at Florence.

Filippo executed many excellent works at Florence, Fiesole, Arezzo, and at Prato. The Death of San Bernardo, painted for the cathedral of Prato, is one of his finest works; it is still in the cathedral. Vasari terms the martyrdom of St. Stephen, in the same church, his master-piece.

Filippo is supposed to have died at Spoleto in 1469, aged 57. He is said to have been poisoned by the relations of Lucrezia Buti, a young Florentine lady whom he seduced, and by whom he had a son, Filippino Lippi, who was also a celebrated painter.

LI'PSIUS, JUSTUS, was born at a village between Brussels and Louvain, the 18th of October, 1547. He was educated at Brussels, Cologne, and Louvain, and at the age of nineteen published 'Variæ Lectiones' of some of the principal Roman authors. This work was so highly esteemed that he was received with distinguished honour at Rome, whither he went in the same year, by Cardinal Granvelle and Pope Pius V. After remaining two years at Rome, he was appointed professor of history at Jena, where he resided till 1574. In 1579 he was appointed professor of history at Leyden, and during his residence here he professed the Reformed religion; but, on quitting Leyden in 1591, he returned to the Roman Catholic church, in which he had been brought up. He was afterwards professor of history at Louvain, where he remained till his death, March 24, 1606. The works of Lipsius, which are very numerous, were collected and published at Antwerp in 1637; and also at Wesel in 1675.

LIQUATION, or ELIQUATION, one of the processes (now almost disused) for separating silver from copper.

LIQUIDAMBAR, a genus of plants of the natural family *Balsamaceæ*. The species are only three in number, all forming fine trees, and occurring in Java, the Levant, and North America. *Liquidambar styraciflua* is the species found in Mexico and the United States, in the latter of which it is called Sweet Gum, and forms a large and fine tree. The wood is of a hard texture and fine grain, and makes handsome furniture; but the tree is more noted for the fragrant liquid resin which exudes from incisions in the stem, though not very copiously. This is called *Liquidambar*, or Oil of Liquidambar, which has a pleasant balsamic odour and an aromatic bitter taste. This, becoming dry and opaque, forms what is called Soft or White Liquidambar, which resembles very thick turpentine, has a feebler odour than the liquid balsam, and contains less volatile oil.

LIQUIDITY is that condition of a material substance in which the particles have a perfect freedom of motion, without any sensible tendency to approach to or recede from one another, except by the action of some external power. [FLUID, FLUIDITY; FLUIDS, ELASTIC.] When the particles of a substance are situated beyond the limits of the attractive forces existing between them, the repulsive power, arising probably from the action of caloric, causes the particles to recede continually from one another, and induces the state of aeriform fluidity: and when the particles of a substance are, from any cause, brought so near one another that the attraction of affinity is in equilibrio with the repulsive force of the caloric, the particles become freely moveable in any direction about one another, whatever be their form; and thus may arise the condition of liquidity.

The particles of a liquid are held together with considerable force notwithstanding their freedom of motion, since a small quantity of a liquid has a tendency to take a spherical form when at a distance from any substance for which its particles have

greater affinity than for one another: this is very evident in mercury, oil, and water, the first of which, on being suffered to fall on a table, immediately divides itself into globules, and the others take a like form when a small quantity of either is suspended from a pointed extremity of any object.

The expansions of any liquid, at different temperatures, for equal increments of caloric, are not equal to one another.

From the experiments of MM. Dulong and Petit, the mean expansion of mercury, in volume, for 1° (Fahr.) between the temperatures of freezing and boiling water, is expressed by .000101; between the freezing-point of water and 392° (Fahr.) by .000102; and between the freezing-point of water and the temperature at which mercury boils, by .000105. The expansion, in volume, of water for 1° (Fahr.) between the temperatures of 34° and 44° is .00002; at 90° it is .0002; and at 212°, .00038. The expansion of spirit of wine, highly rectified, for 1° is, at 0°, .00047, and at 172°, .00083.

LIQUORICE. [Glycirhiza.]

LIRIODENDRON. [Tulip-Tree.]

LIRIS. [Campania.]

LISBON (LISBO'A, in Portuguese), the capital of the kingdom of Portugal, is situated on the northern bank of the Tagus, about 9 miles above the bar or entrance of the river, in 38° 42′ N. lat., and 9° 5′ W. long. It rises in the form of an amphitheatre from the bank of the river, being built on a succession of hills, the highest of which are the hill of Buenos Ayres, or Estrella, to the west, and the castle-hill to the east. Most of the streets are steep, irregular, and tortuous, besides being ill paved and dirty. The new town, built in a valley between the hills, after the earthquake of 1755, contains however many fine streets. At the river's edge is a fine square called Praça de Commercio, one side of which is formed by the Tagus, and the other sides by the arsenal, the custom-house, the exchange, royal library, and other public buildings. Other open places are the Praça da Figueira, or market-place, the Praça do Rocio, and the Passeio Publico, or promenade. The oldest part of Lisbon, east of the castle, consists of narrow streets of lofty houses. Westward of the new streets the town ascends a slope, where are massive buildings, chiefly convents and churches, which crown the summits of the hills, and tower above all the rest. The extreme limits of Lisbon extend about four miles by one and a half; but many parts of the included area are occupied by extensive gardens, plantations, the naked steep declivities of the hills, and by ruins and rubbish. West of the bridge of Alcantara a line of streets parallel to the Tagus connects Lisbon with the market-town and royal residence of Belem, or Bethlehem.

The Tagus from Belem up to Lisbon is little more than one mile in width, but opposite Lisbon it expands to five miles, which gives to the river in front of Lisbon a sea-like appearance. The southern bank is studded with a number of small towns and villages, which supply the capital with provisions. The river gives to Lisbon a most splendid and safe harbour, which might contain all the fleets of Europe. The largest men of war can anchor close to Lisbon. The entrance of the river is defended by two forts, St. Julian on the north bank, and Bugio on a small island opposite, which is joined to the southern bank at low water.

The most striking and imposing buildings of Lisbon are its vast and massive convents, which crown the hills, and look like palaces and fortresses; the royal palace of Ajuda; the theatre of San Carlos, or opera-house; and the cathedral, and other large churches.

The climate of Lisbon is healthy and genial; it is very hot and dry in the summer months, when the heat is often 96° of Fahrenheit, but is relieved by north-west winds: heavy rains fall in November and December; cold clear weather prevails in January, but in February the weather becomes mild again, and the spring begins. Snow is a very rare occurrence.

A fine aqueduct, Os Arcos das Agoas Livres, supplies Lisbon with good water, brought from several springs in the neighbourhood, through tunnels and along viaducts, to a central reservoir, from which the water is distributed to the several fountains about the town. The Gallegos, or porters, draw water in small barrels from the fountains, and sell it from house to house, or cry it about the streets. Lisbon is not provided with conduits or sewers, and all the filth is thrown into the streets, from which it is washed off by the rain into the river.

Olive and orange trees, cypresses and judas-trees, and some elms and poplars, grow near the city. Much of the adjacent country is covered with large gardens called 'quintas,' surrounded by high walls, which bound the view on every side. A pretty large house is attached to them, in which the families of the owners spend part of the summer.

The population of Lisbon, in 1841, was 241,500. Its trade, though much diminished since the loss of Brazil, is still considerable. It exports wine, fruits, and oil; and it imports corn, salt fish, salt butter; cheese, timber, iron, lead, tin, copper, coals, tar, and all sorts of foreign manufactures, with which it supplies the whole southern part of the kingdom. Lisbon has some manufactories of silks, paper, soap, and leather; its goldsmiths and jewellers are very expert; and there are also sugar refineries and potteries.

LISBURN. [Antrim.]

LISCOW, CHRISTIAN LUDWIG, born at Wittenberg, 1701, ranks high in Germany for his satirical writings. About the year 1739 he was private tutor at Lübeck. After this he became private secretary to the Geheimrath von Blome, and subsequently entered the service of Von Heinecker at Dresden. Having offended the English minister at that court, he drew upon himself the resentment of Count Brühl, who caused him to be sent as a state prisoner to Eilenburg, where he died shortly afterwards, Oct. 30, 1760. Some however have questioned the truth of his having been in confinement. The first complete edition of Liscow's works was published by Müchler, in 3 vols. 8vo., Berlin, 1806.

LISIEUX. [Calvados.]

LISKEARD. [Cornwall.]
LISLE, or L'ISLE. [Vaucluse.]
LISMORE. [Waterford.]
LISSA. [Posen.]
LISTOWEL. [Kerry.]

LITANY, a collection of prayers and supplications. The term is derived from the Greek λιτανία, and was adopted by Christian writers at a very early period.

In the Common Prayer Book of 1549 (the first book of King Edward), the Litany was placed between the Communion Office and the Office for Baptism, under the title of 'The Letany and Suffrages;' which book also directed it to be said or sung on Wednesdays and Fridays. In the review of the Common Prayer in 1552, the Litany was placed where it now stands, with the direction that it shall be used on Sundays, Wednesdays, and Fridays, and at other times when it shall be commanded by the ordinary. Till the last review, in 1661, the Litany was used as a distinct service, and followed the Morning Prayer; it was then directed and has ever since continued to be read as one office with the Morning Prayer, after the third Collect for Grace.

LITHARGE. [Lead.]
LITHIC ACID. [Uric Acid.]

LI'THIUM, a metal, the oxide of which is one of the earths, and is called *lithia:* it occurs in a few minerals, combined with silica. When separated, the metal resembles sodium in whiteness; but it has not been much examined.

Oxygen and *Lithium* combine with great readiness, and are separable with difficulty. The compound is *lithia*, which as a hydrate exhibits a crystalline structure; the oxide is supposed to consist of $L^1 O^1$. *Chlorine* and *Lithium* ($Ch.^1 L^1$) form a white semi-transparent substance, very deliquescent, and soluble both in water and in alcohol. By evaporation cubic crystals are obtained. *Sulphur* and *Lithium*, when obtained in combination by decomposing the sulphate of lithia with excess of charcoal, form an extremely pyrophoric substance. *Fluorine* and *Lithium* form a fusible compound, prepared by dissolving lithia in hydrofluoric acid; it is difficultly soluble in water; the solution deposits small opaque crystals.

Nitrate of Lithia (L^1 $Acid^1$) is obtained by adding lithia to the acid. This salt is very deliquescent; when the solution is gently evaporated, crystals are obtained. Its taste is like that of nitre, it is extremely fusible, and becomes by heat as liquid as water. *Carbonate of Lithia* (L^1 $Acid^1$) is very slightly soluble in cold water; it is decomposed by acids with effervescence, and has an alkaline taste. *Sulphate of Lithia* (L^1 $Acid^1$) is very soluble in water; it has a saline taste without bitterness, and crystallises only in irregular masses. *Phosphate of Lithia* is an insoluble compound.

Characters of Lithia and its Salts.—Lithia acts so readily upon platinum, that this property will serve to detect a small quantity in any substance. Lithia is distinguished from soda and potash by its greater saturating power; chloride of lithium is distinguishable from the chlorides of sodium and potassium by its solubility in alcohol, and the solution burns with a red flame. Unlike potash and soda, lithia forms a difficultly soluble carbonate and phosphate.

LITHOGRAPHY, the art by which impressions or prints are obtained by a chemical process from designs made with a greasy material upon stone. In printing from an engraving on a copper or steel plate, the ink is delivered from the incisions made therein with the graver or etching-needle. An engraving on wood, on the contrary, gives its results from the projecting surface of the block, or those parts which are not cut away by the graver. The lithographic process differs from both these modes, the impressions being obtained (by strict attention to chemical affinity) from a level surface.

There are various styles of lithography, but the principle of the art is uniformly the same, being, as we have said, based upon those of chemical affinity.

The stone best calculated for lithographic purposes is a sort of calcareous slate, found in large quantities on the banks of the Danube in Bavaria. Stones much resembling the German have been found in some parts of Devonshire and Somersetshire, and also in Ireland; but they want some of the most essential qualities of those brought from Germany, which are therefore almost exclusively used. Even these vary much in quality, all the strata not being equally good. A good stone is porous yet brittle, of a pale yellowish drab, and sometimes of a gray neutral tint. The stones split into slabs varying from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches in thickness, which are then cut or squared into the different sizes necessary for use, and the face or upper surface of each is made level. In this state the stones are sent from the quarry; but further preparation is yet necessary to fit them for the immediate use of the artist, and they are either grained or polished, according to the nature of the work they are intended to receive. Grained stones are used for drawings in the chalk manner, or for imitations of those produced with the black-lead pencil. Writings, imitations of etchings, pen-and-ink sketches, &c., require the face of the stone to be polished, which is effected by rubbing it with pumice-stone and water, or pumice-stone dust and water, applied with rags.

The two principal agents used for making designs, writings, &c., on stone, are called lithographic chalk and lithographic ink. They are composed of tallow, virgin-wax, soap, shell-lac, and enough lamp-black to impart a colour to the mass. These are incorporated by a peculiar process of burning in a closely covered saucepan over a fire, and the whole is ultimately cast into a mould, and receives the form calculated to fit it for use. The ingredients are the same in the chalk and the ink, but the proportions are varied. The chalk is used as it comes from the mould in a dry state; but the ink is dissolved by rubbing, like Indian ink, in water, and is used in a pen or camel-hair pencil. It is the presence of the soap in this greasy material which renders it soluble in water.

To render the lithographic process intelligible,

let it be supposed that the artist now completes a drawing with the chemical chalk just described, upon a grained stone. If, while in this state, a sponge filled with water were passed over the face of the stone, the drawing would wash out, the chalk with which it is made being, as we have seen, soluble in water, by reason of the soap which it contains. Before, therefore, it is capable of yielding impressions, a weak solution of nitrous acid is poured over it, which unites with and neutralises the alkali or soap contained in the chalk, and renders it insoluble in water. After this, the usual course is to float a solution of gum over the whole face of the stone; and when this is removed, if a sponge and water be applied to its surface, as before supposed, the drawing is found to be no longer removable, because the chalk with which it is executed is now no longer soluble in water. In this state the work is ready for the printer, who obtains impressions by the following process.

Having thrown with the ends of his fingers a few drops of water on the stone, and spread them with a sponge, so as to wet, or rather damp, the whole surface equally, the printer finds that the water has been imbibed by the stone only on those parts not occupied by the drawing, which, being greasy, repels the water and remains dry. A roller properly covered with printing-ink is now passed over the whole stone, which will not even be soiled where it is wet, from the antipathy of oil and water. But the parts occupied by the drawing, being, as we have seen, dry and greasy, have an affinity for the printing-ink, which therefore passes from the roller, and attaches itself to the drawing. In this state it is said to be charged, or rolled in. Damped paper is then put over it, and, the whole being passed through a press, the printing-ink is transferred from the stone to the paper, and this constitutes the impression. By repeating in this manner the operations of damping the stone and rolling in the drawing, an almost unlimited number of impressions may be obtained.

The modes of lithography are, as we have said, various, but the illustration just given will explain the principle of them all. It consists in the mutual antipathy of oil and water, and the affinity which the stone has for both, *i. e.* in its power of imbibing either with equal avidity.

To insure complete success, great nicety is requisite in the preparation of all the agents employed in this art. Those who wish to study or practise the art in its full extent will do well to consult 'A Complete Course of Lithography,' by its discoverer, M. Senefelder, or 'A Manual of Lithography,' by M. Raucourt, both translated into English.

Plates of zinc have lately been much used as substitutes for the German stones, in chemical printing, and the practice is then called *zincography*; but, excepting the difference of the material on which the work is performed, it is precisely the same art as lithography.

LITHONTRIPTICS (λίθος, a stone, and τρίβω, to rub or bruise), medicines or other means which are thought to possess the power of dissolving stone or calculus in the urinary organs. With few exceptions, their employment has been nearly empirical; and aggravation of the case has as frequently resulted as benefit from their employment. The researches of recent chemists and pathologists have given something approaching to a scientific explanation of the circumstances under which calculi form, as well as of their varied characters, so that more good may reasonably be expected from the use of lithontriptics than has hitherto been realised. [CALCULUS.]

LITHOPHA'GIDÆ, a name applicable to all marine *Conchifera*, *Mollusca*, *Radiata*, &c., that penetrate stones, masses of madrepore, and other hard corals, forming therein a nidus for themselves; but more particularly applied to the *Conchifera*. Whether the perforation be effected by chemical erosion or mechanical action is at present undetermined. The erosion is not confined to the *Conchifera* only; for *Patella* has the power of perforating certain rocks to a limited extent: nor to the *Mollusca* generally; for some of the *Echinidæ* (*Radiata*), for instance, are known to make shallow basin-like lodgements in the rocks whereon they dwell. In a discussion on this subject, which took place at a meeting of the Zoological Society in October 1837, Mr. Gray called the attention of the Fellows to some pieces of chalk which he had recently found in the cliffs at Brighton, exhibiting perforations made by the *Patella* and *Photas*, and presenting appearances which he considered to have been produced in the case of the latter genus by the rotatory action of the valves. His remarks elicited much discussion as to the manner in which certain molluscous genera penetrate limestone rocks and other hard substances,—a phenomenon which Mr. Owen thought could not be explained upon the supposition of its being exclusively caused by the rotation of the valves, but that it was chiefly due to the mechanical influence of the currents of water produced by the vibratile cilia of the animal, as noticed by Mr. Garner in a communication 'On the Anatomy of the Lamellibranchiate Conchiferous Animals,' made to the Society in 1838. ('Zool. Proc.,' 1833, 1837.) This very interesting paper, beautifully illustrated, is published in its perfect state in the 'Transactions' of the Society, vol. ii., and the observations alluded to by Mr. Owen are well worthy the attention of the practical as well as the zoological reader, for the subject is of high importance practically, as those who are interested in such great public works as the Plymouth Breakwater well know. The ravages in wood and the hulls of ships made by a small isopodous Crustacean are very serious. We allude to the *Limnoria terebrans*. [LIMNORIA.]

As *conchaceous* genera of *Lithophagidæ*, we may mention *Venerupis*, *Petricola*, *Rupellaria*, *Coralliophaga*, *Cypricardia*, *Clotho* (fossil only), *Ungulina*, *Saxicava*, and others. (Cuvier's *Règne Animal*, vol. iii.)

LITHOSPERMUM, a genus of plants belonging to the natural order *Borragineæ*. The whole of the species are noted for the stony hardness of their pericarps or nuts.

The nuts of *L. officinale* were formerly esteemed as an infallible lithontriptic. Their virtues in this respect are however entirely imaginary. This species is native of Europe, Asia, and North America. It is found in dry and stony places in Great Britain, but sparingly. *L. purpureo-cœruleum* has white, highly polished, and hispid nuts. It is native of middle and south Europe, of the Caucasus in woody mountain places, and of England and Wales in chalky soil. *L. arvense*, Bastard Alkanet, has white and small flowers, the root of a bright red, communicating its colour to paper. It is native of Europe, Asia, Africa, and some parts of North America, and is found plentifully in the corn-fields of Great Britain.

LITHO'TOMY (from λίθος, a stone, and τέμνω, to cut). Although urinary calculi may be extracted from the kidneys, urethra, or bladder, the term lithotomy is restricted to the operation of cutting into this latter viscus for the purpose of removing one or more stones. Before the operation is performed, it is necessary to determine with certainty the presence of a stone, which is done by *sounding* the patient. This consists in introducing into the bladder, through the urethra, a metallic instrument called a sound, by means of which the stone can be plainly felt, and an audible noise perceived on striking it: till this be rendered evident, no surgeon would be justified in undertaking the operation.

Several modes of performing lithotomy have been in use; but that which is mostly had recourse to at the present day is the *Lateral Operation* —so called from the prostate gland and neck of the bladder being cut laterally, in order to avoid wounding the rectum. This operation is usually undertaken with what is called the cutting gorget. The patient having been sounded, to ascertain that the stone is actually within the bladder (for instances have occurred of stone becoming encysted a short period before the operation), and the rectum being emptied by means of a clyster, he is placed on his back upon a table, with his buttocks projecting rather beyond its edge; he should be directed to grasp the outside of each foot with the hand of the same side, and the two pair should then be firmly bound together. A *staff*, which is an instrument shaped very much like a catheter, or sound, but somewhat longer, and grooved on its convex side, is passed through the urethra into the bladder, where it must be retained firmly by an assistant; its convexity looking towards the perineum, and the groove slightly inclined to the left side of the patient. The operator now commences his incision below the bulb of the urethra, about an inch and a quarter in front of the anus, and continues it obliquely downwards to the left of the raphé of the perineum for three inches, till it reaches midway between the tuberosity of the ischium and the anus: this should cut through the integuments and superficial fascia. The next incision, made in the same direction, divides the transversus perinei muscle, and exposes the membranous portion of the urethra, which must be opened, and the groove in the staff felt for with the finger; into this groove, which serves as a director for making the concluding section of the operation, is inserted the beak of the *gorget* (a sort of knife terminated by a beak, that fits into the groove of the staff). The operator now rises from his chair, and, taking the staff in his left hand, raises its handle from the abdomen till it forms nearly a right angle with the patient's body; the gorget is now pushed onwards, along the groove, till it enters the bladder. By raising the handle of the staff, the gorget is made to enter the bladder in a direction corresponding with its axis, and the danger of wounding the rectum is thereby avoided. As soon as the gorget has been introduced, the staff is withdrawn, and a pair of long forceps, expressly adapted for this operation, is passed along the gorget into the bladder, and this latter instrument withdrawn. The stone is now to be seized, and gently extracted.

The dangers to be guarded against after an operation of lithotomy are, inflammation of the bladder and peritoneum; infiltration of urine into the cellular texture of the perineum and parts adjacent; and hæmorrhage.

LITHO'TRITY (from λίθος, a stone, and the root τρι, to pierce); *Lithotripsy* (from λίθος, and τρίβω, to break), 'the reduction of a calculus in the bladder into small pieces, by means of instruments passed into that organ through the urethra, so that the fragments may be discharged through the latter tube, and no necessity remain for the performance of lithotomy.' This operation, which must be ranked among the most brilliant achievements of modern surgery, was first seriously proposed in 1812, and Gruithuisen, a Bavarian surgeon, constructed an apparatus for performing it. Since this period, the operation has undergone successive improvements in the hands of Leroy, Civiale, and Heurteloup. The following is the mode of proceeding adopted. The patient is placed on an operating bed; at its foot is an apparatus for affording a fulcrum to the instrument which is to be passed into the bladder; and two slippers serve for securing the feet of the patient, who is placed in a position nearly resembling that chosen for the operation of lithotomy. The bladder is now moderately distended with warm water injected through a catheter. A pair of strong sliding forceps, the opposite surfaces of which are furnished with teeth, are then introduced, and, the calculus having been seized, the lower piece of the forceps is fixed to a vice at the foot of the bed serving as a fulcrum, and the upper piece is struck with a hammer and the calculus broken. Thus, neither the shock arising from the concussion is communicated to the bladder, nor is this organ liable to be injured by the fragments being forcibly projected against its internal surface. The instruments are then withdrawn, and the fragments are afterwards voided with the urine; or if any remain too large to be thus discharged, the operation is repeated from time to time till all is got rid of.

LITHUA'NIA, a large tract of country in the north of Europe, which now forms the Russian provinces of Vilna, Grodno, Bialystock, Minsk, Mohilev, and Vitepsk, with the palatinate of Augustov, in the kingdom of Poland.

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The first mention of Lithuania occurs in the chronicle of Quedlinburg, A.D. 1009. (Naruszewicz, 'Hist. of Poland,' vol. iv. p. 145.) It was then described as inhabited by a poor and savage nation. In 1235, after having been in some degree subdued and civilised by parties of the Knights Sword-bearers (Ensiferi) and the Knights of St. John of Jerusalem, it became an independent grand-duchy, and attained considerable power. In 1385, Yagellon, the grand-duke, married Hedwig of Anjou, queen of Poland, and from that time Lithuania was united to Poland, and followed its fortunes.

LITI'OPA, a genus of pectinibranchiate molluscs, established by M. Rang, and placed by him between *Janthina* and *Phasianella*. M. Bellanger, we believe, was the first to discover the singular fact that this mollusc, which lives upon floating plants in the sea, sometimes quits them, holding itself secure by a thread. Subsequently M. Rang detected some small glairy masses which appeared to be attached to the foot, and which were easily drawn out to a considerable length.

LITMUS, or LACMUS, a fine blue but fugitive colour prepared from the *Lecomora tartarea*, a lichen which grows in the Canary and Cape Verd Islands. In order to extract the colouring matter, the lichen is cleaned and reduced to powder; this is then mixed with urine and lime, and in a few days the blue colour is developed. The litmus is imported in small cubical cakes of dusky blue colour, which are light and easily reducible to powder.

Litmus is used as a chemical test for detecting the presence of acids, by which it is turned red, and the blue is restored by alkalis, so that when slightly reddened it may also be employed to detect alkalis. It will detect the presence of sulphuric acid, even when diluted with 100,000 times its weight of water.

LITTLETON, THOMAS, was the eldest son of Thomas Westcote, of the county of Devon. He was educated at one of the universities, and thence removed to the Inner Temple, where in due time he became one of the readers of that Society. On the 26th April, 1466 (6 Edward IV.), Littleton was appointed one of the judges of the Court of Common Pleas, and rode the Northamptonshire Circuit. Sir Thomas Littleton married Joan, widow of Sir Philip Chetwin, of Ingestre, in the county of Stafford, one of the daughters and co-heiresses of William Burley, of Broomscroft Castle, in the county of Salop, Esq., with whom he had large possessions. By her he had three sons and two daughters.

Littleton died at Frankley on the 23rd August, 1481, aged about sixty, and was buried in Worcester Cathedral.

Littleton's work on English Tenures is written in Norman French, divided into three books, and addressed to his son. The style of this treatise is very good. It combines the qualities of clearness, plainness, and brevity, in a degree that is extraordinary for the rude age in which the author wrote.

Littleton very seldom quotes any authority. Owing to the alterations in and additions to the law since Littleton wrote, there is much of Littleton's book that is not now law; but Littleton is still an indispensable book to the student of English law. Roger North observes in his 'Life of the Lord-Keeper Guilford:'—'Coke's comment upon Littleton ought not to be read by students, to whom it is at least unprofitable; for it is but a common-place (book), and much more obscure than the bare text without it. And, to say truth, that text needs it not; for it is so plain of itself, that a comment, properly so called, doth but obscure it.' (vol. i. p. 21.) It is much better for the student who wishes to lay well the foundations of his professional knowledge to read Littleton first without the comment of Coke, which he will find useful afterwards, when he wishes to examine any particular point very minutely.

LITURGY (from the Greek λειτουργία, which originally signified at Athens 'certain public functions or duties to which the citizens were personally liable') is a form of public devotion, and more particularly the Office of Common Prayer used in our own or any other church. In the Greek or Constantinopolitan church three Liturgies are in use: those of Basil, Chrysostom, and the Liturgy of the Præsanctified. In the Romish church the Liturgy is divided into several books or offices, as the breviary, the ceremoniale, or office peculiar to the Pope; the missal, or office of the mass; the pontificale, directing the functions of the bishops; and the rituale, or pastorale, for the guidance of the simple priests.

At the Reformation all the Protestant churches on the Continent, without a single exception, introduced Liturgies for the more uniform celebration of divine service.

Previous to the Reformation of the Church of England the service was performed in Latin, and different Liturgies were used in different parts of the kingdom. The cathedrals of York, Lincoln, Hereford, and Bangor, and even Aberdeen in Scotland, had their respective uses; but no cathedral had such a variety of service books for its use as Sarum.

The publication of King Henry the Eighth's 'Primer' in 1535, in the vernacular tongue, was one of the first steps in the reformation of doctrine and worship in the Church of England. In 1547, 1st Edward VI., Archbishop Cranmer, Bishop Ridley, with eleven other bishops and eminent divines, were commissioned by the king in council to compile a Liturgy in the English language, which was confirmed by parliament in 1548, and published in 1549. Upon the accession of Elizabeth, several learned divines, headed by Archbishop Parker, were appointed to make another review of King Edward's Liturgies, when the restoration of the second book of King Edward the Sixth was determined upon, and finally confirmed by parliament. The act received the royal assent April 29th, 1559. In the 1st of James I., after the conference at Hampton Court, a few slight alterations were introduced. In this state it continued till the time of Charles II., who, in 1661, issued a commission to empower twelve bishops and as many Presbyterian divines to consider the objections raised against the Liturgy,

and to make such reasonable and necessary alterations as they should jointly agree upon, nine assistants on each side being added to supply the place of any of the twelve principals who should happen to be absent. The Conference broke up without anything being done, except that some particular alterations were proposed by the Episcopal divines, which in the May following were considered and agreed to by the whole clergy in convocation. The whole Liturgy was then brought to that state in which it now stands, and was unanimously subscribed by both houses of convocation of both provinces on Friday, 20th of December, 1661; and, being brought to the House of Lords the March following, both Houses passed an act for its establishment; and the Earl of Clarendon, then lord-chancellor, was ordered to return the thanks of the Lords to the bishops and clergy of both provinces for the great care and industry shown in the review of it.

LIUTPRANDUS, or LUITPRANDUS, was a deacon at Pavia in the year 946, when Berengarius, marquis of Ivrea and regent of the kingdom of Italy, sent him as his ambassador to Constantinople, where he learnt the Greek language. After his return he was made Bishop of Cremona, where he died.

He was a man of considerable learning for his age, and his works are valuable for the historical information which they contain. The best edition of the works of Luitprand is that of Antwerp, 1640, 'Luitprandi Opera quæ extant,' with very copious notes.

LIVE STOCK. The animals necessary for the stocking and cultivation of a farm, and those which are kept on it for profit, or for the sake of their dung, are called the live stock of the farm, in contradistinction to the dead stock, which consists of the implements of husbandry and the produce stored up for use.

To have the exact number of animals which will give the greatest profit is one of the most important problems which a farmer has to solve. It is of great importance, in taking a farm, to calculate the extent of the arable land, so that it can be properly cultivated by a certain number of pairs of horses or oxen. It is an old measure of land to divide it into so many ploughs, that is, so many portions which can be tilled with one plough each. When there are several of these, it is useful to have an odd horse over the usual number required for two or three ploughs, to relieve the others occasionally. The work is thus done more regularly and with greater ease. The odd horse will always be found extremely useful, and the expense of his keep will be amply repaid by the regularity and ease with which the work of the farm will be done, and the relief which occasional rest will give to the other horses.

The other part of the live stock kept on a farm must depend on various circumstances. Where there is good grazing land, the profit on the improvement of the live stock, or their produce, is evident and easily ascertained. But, where animals are kept upon artificial food or fatted in stalls, it is often a difficult question to answer, whether there is a profit on their keep or not. In most cases the manure which their dung and litter afford is the chief object for which they are kept. In the country, at a distance from large towns, no manure can be purchased: it must consequently be produced on the farm; and for this purpose live stock must be kept. The management and feeding of live stock is therefore an important part of husbandry. Some farmers have made great profits by improving the breed of cattle and sheep, by selecting the animals which will fatten most readily, and by feeding them economically. It requires much experience and nice calculations to ascertain what stock is most profitable on different kinds of land and in various situations. Unless very minute accounts be kept, the result can never be exactly known. It is not always the beast which brings most money in the market that has been most profitable; and many an animal which has been praised and admired has caused a heavy loss to the feeder. It will generally be found that the principal profit in feeding stock is the manure, and to this the greatest attention should be directed.

LIVER. The liver is the secreting organ or gland by which the bile is formed. Its existence has been traced very low in the scale of animals; and parts supposed to have an analogous function have been found in insects, but their nature is at present a disputed question. The differences in regard to size, form, and colour, which the liver presents in the higher animals (mammalia, birds, reptiles, amphibia, and fishes), are of no great importance.

In man the liver is a large solid viscus, of a reddish brown, or mottled red and yellow, colour, situated immediately beneath the diaphragm, in the right hypochondriac, and partly in the epigastric region of the abdomen. [ABDOMEN.] When enlarged, it can be felt by the hand applied below the ribs on the right side. It is flattened in the vertical direction, is thinner at its anterior than at its posterior border; and its outline, when viewed from above, is irregularly ovoid. The upper surface, which is convex, is applied to the diaphragm; the lower, which is irregularly concave, lies above, and in contact with the stomach, large intestine, and right kidney, has attached to it the gall-bladder, and presents two deep furrows, which divide it into several compartments, termed by anatomists lobes. Of the furrows, one running from before backwards (the longitudinal fissure), transmitted, during uterine life, the vessel which conveyed the blood from the placenta to the heart of the fœtus; it afterwards contains merely the cord-like remains of that vessel, now impervious in the greater part of its extent. The second furrow, in the under surface of the liver, is called the transverse fissure, since it crosses the former at right angles, lying however chiefly to its right side; it serves to allow the entrance of blood-vessels and nerves to the liver, and the exit of the bile-ducts. Like other viscera of the abdomen, the liver receives an investment from the lining membrane of that cavity, the peritoneum, which, being reflected from it at different points, forms broad bands connecting the liver with surrounding parts.

The intimate structure of the liver consists of ramifications of the hepatic artery and vein, the portal vein, and the hepatic ducts. The ultimate arrangement of these different blood-vessels in the liver is very peculiar. When the substance of the liver is torn, it is seen to be composed of innumerable granules of about the size of a pin's head; each of these contains the elements of a liver. They are connected most intimately with the branches of the hepatic vein, a small twig of which is contained in the interior of each, while on their exterior surface and in their interstices run branches of the portal vein, hepatic artery, and bile-duct. The mass of each granule or lobule is constituted in great part of a close network of capillary blood-vessels, which communicate on the exterior with the small branches of the portal, and on the interior with the twig of the hepatic vein. The blood brought by the portal vein therefore is poured into the capillary net-work of each granule or lobule of the liver, and, after yielding in it the constituents of the bile, is received into the branches of the hepatic vein, whence it is transmitted to the general vascular system. The branches of the hepatic artery soon become very minute on the exterior of the lobules, and few can be traced into their interior; it is probable that, after having nourished the coats of the vessels and ducts, and other tissues of the liver, the blood of the hepatic artery is poured into the minute network formed by the ultimate division of the portal vein, and contributes, with the blood of that vein, to yield the constituents of the bile.

The biliary canals, reduced in number by successive reunion to two tubes, one from the right, the other from the left lobe of the liver, issue at the transverse fissure of its under surface, there soon unite, and form one main trunk, the hepatic duct. After running a short distance together with the portal vein, hepatic artery, and nerves, in a quantity of dense cellular tissue inclosed within the fold of the peritoneum, the hepatic duct meets and unites with the duct of the gall-bladder, or cystic duct. The tube resulting from the junction of the hepatic with the cystic duct is called the *ductus communis choledochus:* it is about three and a half inches in length, and terminates by opening, together with the duct of the pancreas, into the portion of the intestine named duodenum, at the distance of a few inches from the stomach.

The gall-bladder is a pyriform membranous sac, lodged in a shallow depression at the interior surface of the liver, which communicates, as we have stated, with the excretory duct of the liver, by means of a tube called the cystic duct. [BILE.]

Diseases of the Liver.—The liver is subject to all those general morbid changes which, depending on disordered actions of the blood-vessels, modification of the nutritive process, or alterations in the blood itself, may affect most organised parts of the body: such are inflammation (hepatitis), acute and chronic; hypertrophy and atrophy; induration and softening; and the different kinds of tumours or transformations of tissue, carcinoma, or cancer, medullary sarcoma, fungus hæmatodes, melanosis, and scrofulous tubercle. It is occasionally infested by parasitic animals (hydatids), which may likewise affect other parts of the body.

But the liver is also liable to other diseases which appertain to it specially, and are connected with its function—secretion. The chemical changes which give rise to the formation of bile in the liver may be so deranged, that one or all of the ingredients of that fluid are increased or diminished in quantity, or vitiated in quality, and such disorder of the secreting process may manifest itself in several ways: the imperfectly formed fluid passing into the intestines may cause irritation there, and consequently diarrhœa, or, being absorbed into the blood, may produce jaundice and its concomitant symptoms; or some of the ingredients of the bile may concrete into solid masses in the ducts of the liver or the gall-bladder, forming gall-stones. The diseased state of the liver, in which it becomes impregnated with an unnatural quantity of fatty matter, may also be reckoned among the diseases appertaining to the special function of the organ, for the bile naturally contains a large proportion of fatty matter (cholesterine), though the chemical composition of this substance, and that of the oil or fat with which the liver is impregnated in disease, appears to be different.

The treatment of diseases of the liver is regulated by the general principles according to which the cure of diseases in other parts is attempted, and will of course vary with the nature of the particular affection requiring it.

LIVERPOOL, a municipal borough, parliamentary borough, and seaport of Lancashire, stands on the right or east side of the æstuary of the Mersey, in 53° 24′ N. lat., and 2° 58′ W. long.

No mention is made of Liverpool in Domesday-book; but it is supposed that a castle, the forerunner of the town, was built on this spot in the Conqueror's time. In 1173 the town received its first charter from Henry II. A second charter was received from John in 1207; and a third, constituting it a free borough for ever, was obtained from Henry III. in 1227. The town flourished under the privileges thus granted. Until the close of the 17th century, Liverpool was a chapelry attached to the parish of Walton, but at that time it was made a separate parish, the population of which was about 5000 souls. In 1650 it is said that there were only 15 ships belonging to the port. Towards the middle of the next century three docks were constructed for the convenience of the shipping employed in the African and West Indian trades. In 1764 more than half the African slave-trade was carried on by the merchants of Liverpool. From the settlement of the cotton manufacture in Lancashire, Liverpool has become the port where the great bulk of the raw material of the manufacture is received, and whence the exports of manufactured goods are chiefly made to all parts of the world. The cotton imported into Liverpool in 1847 amounted to 1,088,215 bales, being more than six-sevenths of the whole quantity imported into Great Britain. Still more recently, and especially since the employment of steam-vessels for the conveyance of merchandize, this port has enjoyed a very large proportion of the trade between England and Ire-

land, for the prosecution of which it is peculiarly well situated.

The most important public buildings are the Town-Hall, the Exchange Buildings, the Custom-House, and St. George's Hall. In the Town-Hall the ground-floor contains the council room, several committee rooms, the mayor's, town clerk's, treasurer's, and town-surveyor's offices. The principal story contains a very fine suite of rooms, which are magnificently furnished. The saloon, the two drawing-rooms, the two ball-rooms, and the banquet-room, which all communicate with each other, are noble apartments. The Exchange Buildings form with the town-hall three sides of a quadrangular area, which is used by the merchants of Liverpool as an Exchange. This quadrangle is 197 feet long from north to south, and 178 feet wide. The custom-house, in which are also contained the dock-offices, the excise-office, the post-office, the stamp-office, and other public offices, is situated on the site of the old dock. The extreme length, measuring from east to west, is 466 feet. St. George's Hall, or the New Assize Courts, is a sumptuous building in the Corinthian style. The eastern façade is 400 feet long, and has a columnar projecting centre, with depressed wings. Within the central projection is an ambulatory, 26 feet wide; behind this is St. George's Hall, a noble vestibule or hall, bounded on the north and south by law courts, to which it affords approaches.

Liverpool contains upwards of 40 churches belonging to the Establishment; these, with the various episcopal and dissenting chapels, give a total of more than a hundred places of worship.

Liverpool contains many buildings devoted to charitable purposes. The workhouse, the infirmary, the lunatic asylum, and the numerous smaller hospitals and dispensaries, are efficient establishments. One of the finest buildings of this description, now constructing, is the Sailors' Home, of which the first stone was laid by Prince Albert in 1846. The Blue-coat School, established in 1709, has accommodation for 250 boys and 100 girls, who are educated, boarded, and clothed gratis. There are also charitable schools for the blind, and for the deaf and dumb, two corporation free-schools, and numerous other schools supported by different denominations of Christians. The Collegiate Institution, opened in 1843, is a fine Elizabethan structure; it is appropriated to a school for the higher branches of education. Among the other educational and literary establishments of Liverpool, the chief are the Royal Institution, the Literary and Scientific Institution, the Mechanics' Institute, the Athenæum, and the Lycæum.

The borough gaol is a large building on the plan recommended by Howard; it has been principally used for the confinement of debtors. The County House of Correction at Kirkdale stands within the limits of the borough.

The market-places in Liverpool are upon an extensive scale. St. John's Market is open daily for the sale of meat, poultry, fruit, and garden vegetables. The fish-market is on the opposite side of the street in which St. John's Market stands. There are several smaller market-places in different parts of the town.

Some of the modern commercial buildings are architectural ornaments to the town: among them is the Royal Bank, in the Italian style; the Royal Insurance Office, in Florid Italian; the Union Bank, in the Grecian style; Brunswick Buildings, on the model of the Farnese Palace; the Branch Bank of England; and the Commercial Bank Buildings.

The principal places of public amusement are:—the Theatre, the Royal Amphitheatre, the Liver Theatre, the Wellington Assembly-Rooms, the Rotunda, and the New Philharmonic Hall, which will, it is said, have the largest music-room in England. There are also a large and well-stocked Botanic Garden at Edge Hill, and a Zoological Garden in Derby Road. Several cemeteries on a large scale have been made in or near Liverpool.

The municipal borough of Liverpool is divided into 16 wards, and is governed by 16 aldermen, of whom one is chosen annually to be mayor, and 48 councillors. The population in 1841 was 286,487. The parliamentary borough returns 2 members. The population in 1841 was 282,656.

The magnificent docks of Liverpool, unequalled perhaps in the world, are noticed under Docks.

The receipt of customs duties in 1846 was 3,622,056*l.*

The growth of the trade of Liverpool has been very rapid. The number and tonnage of the vessels which entered the port in 1846 were:—

	Vessels.	Tons.
British . .	2505	829,874
Foreign . .	1087	427,862
	3592	1,257,736

Eight parts out of nine of all the American cotton brought to this country are shipped to Liverpool. There have often, in recent years, been 50,000 hogsheads of sugar, 20,000 barrels and bags of coffee, and 10,000 puncheons of rum, brought to Liverpool in one year. It has been estimated that 50,000,000 cwts. of goods have been shipped at the Liverpool docks in one year.

The post-office revenue of Liverpool for 1846 amounted to 63,000*l.*, being greater than that of any other town except London.

About two-fifths of the tonnage inwards and outwards are engaged in the trade with the United States of America. Liverpool keeps up a larger intercourse with Ireland than all the other English ports combined, and it has benefited more than any port in the kingdom (London alone excepted) from the application of steam power to navigation. Besides those which proceed to the United States and other foreign countries, steamships of the first class proceed to and arrive from Dublin daily; and it has communication more or less frequently with Drogheda, Belfast, Waterford, Newry, Londonderry, Glasgow, the Isle of Man, Whitehaven, Beaumaris, Bangor, Menai Bridge, and Carnarvon. Most of the Irish emigrants come to Liverpool to embark.

The inland trade of Liverpool is much assisted by means of canals, the most important of which in extent is the Leeds and Liverpool Canal, 128 miles long. The Mersey and Irwell Navigation, the Duke of Bridgewater's Canal, and the Elles-

mere Canal also connect Liverpool with the inland counties. Besides the various ramifications of the London and North Western Railway, there are now also the Liverpool and Bury Railway, and the Liverpool and Preston Railway.

LIVERWORTS, or LICHENS, a family of plants belonging to the class *Cryptogamia*, of which a definition is given under LICHENS. The order consists of between fifty and sixty genera, which are divided by Fries into four sub-orders :—*Hymenothalami*, *Gasterothalami*, *Idiothalami*, and *Coniothalami*: to these some systematists add *Byssaceæ*. These are again subdivided into several tribes, each tribe comprising several genera. The species of the genus *Usnea* are amongst the most common of the Lichens which cover the trunks of aged trees. The species of the genus *Everina* are common in Great Britain. One of them, *E. prunastri*, has a peculiar power of imbibing and retaining odours, and on this account is in much request as an ingredient in perfumed cushions and sweet pots. It has been recommended as a remedy in pulmonary affections. It is frequently found on the oak and other trees. The species of *Parmelia* are exceedingly numerous. One of the most common throughout Europe is the *P. parietina*, Yellow Moss. It has a very bitter taste, which has caused it to be used as a tonic in medicine, and it has been recommended as a remedy in intermittent fever. *P. tartarea* yields the dye known by the name of Cudbear. *P. parella* affords the substance known as Litmus, or Lacmus. One of the species of the genus *Sticta*, *S. pulmonacea*, has been used as a substitute for the Iceland Moss. It is used in Siberia for giving a bitter flavour to beer. It is a native of Great Britain, and is found on the trunks of trees in mountainous districts, almost entirely covering them with its large shaggy fronds. The tribe *Lecidinæ* embraces the important genus *Cladonia*, and also *Cenomyce* and *Scyphophorus*, which are often only regarded as subgenera of Cladonia. They have both been used in medicine as astringent and febrifuge.

LI'VIUS, with his full name, LU'CIUS LI'VIUS ANDRONI'CUS, was the first person who introduced a regular drama upon the Roman stage. (Liv., vii. 2.) The time and place of his birth are uncertain ; but his first play was probably exhibited 240 B.C., in the year before Ennius was born. The fragments of his works which have come down to us are too few to enable us to form any opinion respecting them: Cicero says that they were not worth being read a second time. ('Brut.,' c. 18.) They were however very popular at the time they were performed, and continued to be read in schools till a much later period. (Hor. 'Epist.' II. i. 69–73.) Livius wrote both tragedies and comedies.

LI'VIUS, TITUS, the Roman historian, was born at Patavium (Padua), B.C. 59. We possess very few particulars respecting his life. He appears to have lived at Rome, and to have been on intimate terms with Augustus, who used, according to Tacitus ('Ann.,' iv. 34), to call him a Pompeian, on account of the praises which he bestowed upon Pompeius's party. He also encouraged the historical studies of Claudius, who was afterwards emperor. (Suet. 'Claud.,' c. 41.) He died A.D. 17, in his 76th year.

Livy's great work, which was originally published in 142 books, gave an account of the history of Rome, from the earliest period to the death of Drusus, B.C. 9. Of these books only 35 are now extant, namely, the first ten, which contain the history of the city to B.C. 293 ; and from the twenty-first to the forty-fifth inclusive, which commence with the Second Punic War, B.C. 218, and continue the history to the conquest of Macedon, B.C. 167. There also exist brief epitomes of the lost books, as well as of those which have come down to us, which have been frequently supposed, though without sufficient reason, to have been compiled by Florus. We have however only epitomes of 140 books; but it has been satisfactorily shown by Sigonius and Drakenborch, on Livy, 'Ep.' 136, that the epitomes of the 136th and 137th books have been lost, and that the epitome of the 136th book, as it is called, is in reality the epitome of the 138th. The fragments of the lost books, which have been preserved by grammarians and other writers, are given in Drakenborch's edition. That portion of Roman history which was contained in the lost books has been written in Latin by Freinshemius.

We have no means for ascertaining at what time the whole of the history was completed, though there are indications of the time in which some particular portions were written. In i. 19, Livy mentions the first shutting of the temple of Janus by Augustus after the battle of Actium, B.C. 29 ; whence we may conclude that the first book was written between this year and B.C. 25, when it was closed a second time. He must also have been engaged on the 59th book after B.C. 18, since the law of Augustus, 'De maritandis ordinibus,' passed in that year, is referred to in the epitome of the 59th book.

Tacitus and Seneca, among the later Roman writers, speak in the highest terms of the beauty of his style and the fidelity of his history—praises which have been constantly repeated by modern writers. But, while most will be ready to admit that his style is eloquent, his narrative clear, and his powers of description great and striking, it can scarcely be denied that he was deficient in the first and most important requisites of a faithful historian—a love of truth, diligence and care in consulting authorities, and a patient and painstaking examination of conflicting testimonies.

The best editions of Livy are those by Crevier, 1735–1740 ; Drakenborch, 1738–1746 ; Ernesti, 1804 ; Ruperti, 1817 ; Döring, 1816–1824 ; and Kreysig, 1823–1827. His Roman History has been translated into most European languages ; the most esteemed are the translations in German by Wagner (1776–1782) and Cilano (1777–1779) ; in Italian, by Nardi (1575) ; in English, by Philemon Holland (1600, 1659), by Baker (1797) ; and in French, by Dureau de la Malle and Noel (1810–1812 ; and 1824).

LIVONIA, one of the Baltic provinces of Russia, situated between 56° 34′ and 59° 3′ N. lat., 23° 20′ and 27° 38′ E. long., is bounded N.

by Esthonia, E. by Lake Peipus and Pskow, S. by Vitepsk and Kourland, and W. by the Gulf of Livonia or Bay of Riga. The area is 18,058 square miles; the population in 1846 was 814,100. The surface is generally level, with here and there some hills, which rarely exceed 100 feet in height. There are no mountains properly so called: the highest ground of the whole province is the Mesenberg, near Wenden, which rises to the height of 1200 feet. Livonia is covered with vast forests, lakes, rivers, marshes, and heaths. The soil on the sea-coast, which is bounded by high cliffs, is very sandy: in the interior, sand, clay, loam, and moorland alternate; but there are also many very fertile tracts. In the south, especially on the banks of the Düna, there is some very picturesque scenery. Most of the forests and marshes are in the west. Of the lakes, 1120 in number, the most considerable are—the great Lake of Peipus, united by a narrow channel with that of Pskow on the north-east; and the Lake Wirzjærw, 80 square miles in extent, in the centre of the province, which is connected by the Great Embach river with Lake Peipus. The principal river is the Düna, which is the boundary between Livonia and Kourland till it reaches Kirchholne, whence it runs N.W. into the Bay of Riga at Dünamunde. The smaller rivers and streams are very numerous.

The climate is cold and raw from October till the end of May; very hot in the three summer months. September has some fine days, but the nights are often frosty.

The chief occupations of the inhabitants are agriculture and the distillation of spirits. The country produces rye and barley, flax, hops, hemp, and linseed. The fruit, such as apples, plums, and cherries, is very indifferent. There are some good horses on the estates of the nobles, but those of the peasantry are small and of little value. The horned cattle are small; sheep of the German breed are kept by the nobles; the peasants have an inferior breed, the coarse black wool of which is manufactured into cloth. Goats, swine, and domestic poultry are kept. There is abundance of game, white and gray hares; the other wild animals are bears, wolves, lynxes, foxes, beavers, otters, martins, badgers, and squirrels. The Lake Peipus abounds in fish. There are no minerals of importance nor manufactures, except in Riga. The exports are corn, hemp, flax, and linseed; the imports are salt, iron, lead, colonial produce, wine, manufactured goods, and articles of luxury.

The province of Livonia is divided into 5 circles named from the chief town in each. These are, Riga: Arensberg, or Arensburg: Dorpat: *Pernau*, a well-built fortified town and port, with 10,000 inhabitants, at the mouth of the Pernau, which flows from the Wirzjærw Lake, and falls into the north-eastern part of the Gulf of Livonia. Only vessels of 6 feet draught can come up to the town; those of larger size anchor in the roads about a mile from the harbour, where they are unloaded by small craft. The exports are chiefly corn, flax, and hemp; the imports consist of wine, brandy, salt, drugs, and various kinds of manufactured goods. The total value of the exports in 1842 was 103,015*l.* 16*s.* 2*d.*, which represents the freight of 75 ships of 4451 tons' burthen. *Wenden*, N.E. of Riga, situate on the Aa, which drains the centre of the province, has a population of 2500. The fortress of *Dünamunde*, built on an island, in the estuary formed by the embouchures of the Düna and the Aa, deserves mention for its light-house, and as defending the entrance to the harbour of Riga.

(De Bray, *Essai sur l'Histoire de la Livonie*, 3 vols., Dorpat, 1817; Hassel, *Erdbeschreibung*, &c.)

LIVORNO (*Leghorn*, *Livourne*), a large maritime town and free port in Tuscany, is situated in 43° 33′ N. lat., 10° 19′ E. long., at the southern extremity of a low and partly marshy plain extending from the left bank of the Arno to the hills of Montenero, which end abruptly on the sea about 3 miles S. of Livorno. The city is 14 miles S. by W. from Pisa, 45 W. by S. from Florence, and has 78,000 inhabitants, of whom about 15,000 are Jews. The town is neatly and regularly built; the streets are wide and mostly straight, and there is a fine square in the middle of the town. The western district, called La Nova Venezia, is intersected with canals by which the goods are carried in boats from the shipping in the harbour and landed before the warehouses of the merchants. Many of the private houses are handsome. The shops are well supplied with goods, and fitted up in good taste. The English and Lutherans have chapels and burying-grounds, the Greeks a church, and the Jews a very handsome synagogue. The English burying-ground, situated on the ramparts, is adorned with numerous marble monuments—among others is that of Smollett, who died here. The town itself is little more than two miles in circumference; but two large suburbs, one beyond the north or Pisa gate, and the other to the south, called Borgo Cappuccini, have gradually increased to the size of towns, and have been lately included within the boundaries of the Porto Franco, wherein goods can be landed and warehoused, and exported again without paying duty. The outer mole, which is more than a mile in length, and joins the light-house, affords a pleasant walk. The harbour is tolerably large, but not sufficiently deep for large vessels, which lie in the roads, where the anchorage is safe and good. The Darsena, or interior harbour or dock, is only fit for smaller vessels. Near the Darsena is a fine colossal statute of Ferdinand I., the benefactor of Livorno. The lazzarettos, of which there are three, outside of the town and on the sea-shore, are remarkable for their excellent distribution and perfect security, being surrounded by wet ditches, and furnished with extensive warehouses and convenient lodgings.

Livorno is rather a commercial than a manufacturing town; it has however tan-yards, ropewalks, soap and candle factories, glass-works, establishments for the manufacture of coral ornaments, woollen caps, cream of tartar, borax, and sulphur. Steamers and sailing-vessels are built. The town has a casino or assembly-house, a theatre, very good inns and coffee-houses. Educational establishments of all kinds are numerous. A railroad connects the town with Pisa, Pontedera, Empoli, and Florence.

The imports into Livorno are either for con-

sumption or for deposit. They consist of corn, tissues of cotton, hemp, and wool, sugar, raw and manufactured silk, bronze work and jewellery, salt fish, hides, hemp and flax, coffee, raw cotton and cotton yarn, wool, spices and drugs, dye-stuffs, porcelain, gum, wine, brandy, rum, spirits, tobacco, &c., to the value of about 3,000,000*l.* annually. Many of these articles of course enter into the exports, for the transit trade is very extensive. Other exported articles are—oil, anchovies, paper, and rags, straw hats, marble and alabaster, works of art, timber, cork, coral, tallow, potash, &c. The total value of the exports amounts to about 2,000,000*l.* a year. The number of vessels that enter the harbour annually is over 4000, with about 400,000 tons' cargo. The number of ships that clear out annually are about the same in number, but the freights are somewhat less. About 2000 of these vessels are Tuscan. Steamers ply regularly to Cività-Vecchia, Naples, Sicily, Genoa, Nice, and Marseille.

LIXI'VIUM, a term which is synonymous with *ley*. It was used by the older chemists to signify a solution of an alkali in water.

LIZARD. [LACERTIADÆ.]

LIZIER, ST. [ARIE'GE.]

LLAMA (genus *Auchenia*), a genus of Ruminants of the family *Camelidæ*, and representing in the mountains of Peru and Chili the camels (*Camelus*) of the deserts of Arabia or Bactria. In dentition, at least very nearly; in outward form, excepting that there is no hump on the back; in the general structure and cellular apparatus of the stomach, with the concomitant power of abstaining for a long time from water; in the expression of the large, full, overhung eye; in the mobility and division of the upper lip; in the fissured nostrils; in the slenderness of the neck; and in the long woolly character of the clothing—the Llama and the camel exhibit striking points of agreement. In the feet however the difference is very considerable. The feet of the camel are broad and extensively cushioned below, being in fact precisely adapted to the sands of its congenial desert; whereas the slender, elastic, claw-tipped foot of the Llama is destined for the crags of the Cordilleras.

The foot of the Llama consists of two springy toes completely divided, each having a rough pad beneath, and at the tip a strong hoof; these hoofs are pointed at the extremity, and hooked down somewhat like a claw; they are compressed laterally, and the upper surface presents an acute ridge, while the under surface is linearly concave, a form well fitted for security on the mountain range. For the osteology of the Camel and the Llama, see Cuvier's 'Ossemens Fossiles.'

The Spaniards, when they conquered Peru and Chili, found the Llama, which seems to have been the only beast of burden possessed by the natives as a domestic animal: it was not merely a beast of burden—its flesh was eaten, and its wool was woven into cloth. It was at once pack-ox and sheep, and was described by the early Spanish writers as a sort of sheep. Its skin was also prepared as leather.

One of the labours to which the Llama was subjected was that of bringing down ore from the mines among the mountains. Its ordinary load was 80 or 100 pounds, and its average rate of travelling with this burden was from 12 to 15 miles a day over rugged paths and through mountain passes; but, like the camel, if too heavily laden, it would lie down, and obstinately refuse to proceed; nor would it bear to be urged beyond its accustomed pace. Gregory de Bolivar estimated that in his day 300,000 were employed in bearing the produce of the mines of Potosi alone, and 4,000,000 annually killed for food.

Augustin de Zarate, treasurer-general in Peru in 1544, in his account of the conquest, speaks of the Llama, as it was observed in the mountains of Chili, as a sheep of burden. He says that, in situations where there is no snow, the natives, to supply the want of water, fill the skins of sheep with that fluid, and make other living sheep carry the skins; for he remarks that these Peruvian sheep are large enough to serve as beasts of burden. De Zarate evidently had the eye of a zoologist, for he says that these sheep resemble the camel in shape, though they have no hump. He states that they can carry about 100 pounds or more, that the Spaniards used to ride them, and that their rate of travelling was 4 or 5 leagues a day. His description appears to be that of an eye-witness, and bears upon it the impress of truth. When they are tired, says De Zarate, they lie down, and the load must be taken off, for neither beating nor help will make them get up. Their weariness is manifested in a very disagreeable way when a man is on one of them; for our author says that, if the beast is pressed on under such circumstances, it turns its head and discharges its saliva, which has a bad odour, into its rider's face. He speaks of them as of great utility and profit to their masters, praises their good and fine wool, particularly that of the species named *Pacas*, which have very long fleeces, and shows that their keep costs little or nothing, either in money or trouble; for they are satisfied with a handful of maize, and are able to go for four or five days without water. He declares that their flesh is as well flavoured as that of a fat Castilian sheep, and notices the public shambles for the sale of it in all parts of Peru then frequented by these animals. But, he remarks, this was not the case on the first arrival of the Spaniards; for, when an Indian killed a sheep at that time, his neighbours came for what they wanted, and then another Indian would kill a sheep in his turn.

Similar information is given us by other old writers, as John De Laet (fol., Leyden, 1633), D'Acosta, Hernandez, Captain G. Shelvocke (1719-22), Molina, and many others. (See Bennett, in 'Gardens and Menagerie of the Zoological Society.')

As a beast of burden in its native mountains, whether of Peru or Chili, the Llama has yielded to the mule. But it is still most important on account of one of its qualities which attracted the attention of the ancient Peruvians; it is a wool-bearer, and that of no ordinary kind, the wool approximating in its character to silk. Large quantities of this material are imported into Eu-

rope for the manufacture of shawls and other delicate fabrics, and the improvement of this material has been made a subject of earnest consideration and trial. The older writers leave us in considerable doubt as to the number of species belonging to the genus *Auchenia*. It would appear however that the domestic Llama, a stout strong animal, variable as to colouring, but mostly white, is the descendant of a wild species termed the Guanaco, and that the Vicuña, and the Paca or Paco, are still further distinct.

In the 'Farmer's Library,' article 'Sheep,' a short chapter is devoted to the Llama, principally with regard to the wool of the different species. After entering into some accounts left us by the Spanish and other writers, the author deduces the following result as regards species :—

1. *Tame and wild.*—The Guanaco, Guancu, Huanco (*Auchenia Llama*).

Llama (*Auchenia Llama*).

2. *Tame and wild.*—The Paco, Paca, or Alpaca (*Auchenia Alpaca*, Desm.).

3. *Wild.*—The Vicuña, Vicugna, Vigognia, &c. (*Auchenia Vicuña*).

Vicuña (*Auchenia Vicuña*).

4. *Wild.*—The Taruga, or Taruca (*Auchenia Taruca*), a doubtful species, described by De Laet as a solitary animal of a dark burnt brown colour, with pendulous ears, larger than the Vicuña, but distinct from the wild Guanaco.

Some zoologists consider that there are only two truly distinct species, the Guanaco and the Vicuña; if so, the varieties must be very marked. In the tame Guanaco (or Llama) the wool is long and coarse; in the wild Guanaco it is much finer and softer, and of a cinnamon brown. In the Vicuña, a small species inhabiting the mountain-ranges on the verge of perpetual snow, the wool is exquisitely fine, but short, and of a pale yellow brown. Thousands are annually killed in Peru for this material alone.

In the Paca, or Alpaca, the domestic breed of which is often of an intense lustrous jet black, the wool falls in long flakes, glossy and silken, reaching down to the knees. This is the Paco-Llama of De Laet. With respect to the Taruga of De Laet, nothing is known. Of Alpaca silk-wool vast importations are yearly made into this country; it is worked up into exquisite textures, chiefly at Paisley, Glasgow, &c., and great quantities of yarn, varying from 6*s.* to 12*s.* 6*d.* per pound, are sent to France.

The habits of the Guanaco, or Wild Llama, are much better known than those of any other species, and have been described at length by Mr. Darwin in the 'Voyage of the Beagle.' This species lives in the highlands of Patagonia, Chili, and Peru, descending into the valleys on the approach of winter. It is gregarious, wild, fleet, active, and inquisitive, and takes readily to the water. General colour, rich rufous brown; head and part of the neck gray; tail a little raised up and curled down; neck long; height at the top of the shoulders, 3½ feet. (See Bennett, Darwin, and others.)

Attempts to naturalise the Llama, Alpaca, and Vicuña, in Europe have been made with spirit and judgment, but hitherto without decided success. The Earl of Derby has propagated the Alpaca in his private menagerie at Knowsley.

No fossil species of Auchenia has yet been discovered; but Mr. Darwin brought home from South America the remains of a most interesting animal nearly allied to the Llamas, which Mr. Owen has characterised under the name of *Macrauchenia*. The cervical vertebræ in this form present the same character in the absence of the holes for the vertebral arteries in the transverse processes as in the Llamas and Camels.

LLANDAFF. [Glamorganshire.]
LLANDILO-FAWR. [Caermarthenshire.]
LLANDOVERY. [Caermarthenshire.]
LLANELLY. [Caermarthenshire.]
LLANGADDOCK. [Caermarthenshire.]
LLANGOLLEN. [Denbighshire.]
LLANRWST. [Denbighshire.]
LLANTRISAINT. [Glamorganshire.]

LÔ, ST., the capital of the French department of Manche, is situated in 49° 6′ 59″ N. lat., 1° 5′ 55″ W. long., at a distance of 157 miles W. from Paris, and has tribunals of first instance and of commerce, a college, and (in 1841) 8951 inhabitants. The central part of the town stands on a rocky

eminence above the Vire, from which the other streets, all irregularly and badly built, extend down the slopes in all directions. The square called Champ-de-Mars is prettily laid out with avenues of trees. The most remarkable structures are the church of Notre-Dame, in which are fine painted windows, the gift of Louis XI.; the church of Sainte-Croix, the best preserved edifice in the oldest Norman style in France; the church of St.-Thomas, which is now a corn market; and the tower in the garden of the prefecture, which is all that remains of the former defences of the town. The chief manufactures of St.-Lô are drugget, woollen yarn, tape, lace, linen, and leather. There is a considerable trade in horses for the French cavalry, in cattle, corn, small wares, cloth, &c. The town has a museum, dye-houses, and bleaching establishments.

LOACH. [COBITIS.]

LOADSTONE. [IRON—*Ores.*]

LOAM, a soil compounded of various earths, of which the chief are silicious sand, clay, and carbonate of lime, or chalk. The other substances which are occasionally found in loams, such as iron, magnesia, and various salts, are seldom in such proportions as materially to alter their nature. Decayed vegetable and animal matter, in the form of humus, is often found in loams in considerable quantities, and the soil is fertile in proportion. [SOIL.]

LOANGO, on the west coast of Africa, extends from Cape Lopez Gonsalvo in 0° 44′ S. lat., to the river Congo or Zaire, which separates it from Congo in about 6° S. lat. *Loango*, the capital town, stands in a large plain, at the distance of three miles from the sea, in 4° 40′ S. lat., 12° E. long. It is the place of residence of the king, whose government, like that generally prevalent among the barbarous tribes of this part of Africa, is the most absolute species of despotism.

A great part of the country is covered with thick woods, and it is only mountainous in the interior towards the south. In the north it possesses some lakes of considerable extent, from which, and from the mountains, many rivers descend to the sea.

LOANO. [ALBENGA.]

LOASA'CEÆ, a small natural order of polypetalous Exogens, consists of herbaceous and frequently annual plants, covered with stinging hairs which cause considerable pain by the wounds they inflict.

LOBEL, or L'OBEL, MATTHEW, one of the founders of the science of systematic botany, was born in Flanders, in the year 1558, travelled in various parts of the middle and south of Europe, and finally settled in England, where he became physician to James I. He is chiefly known now as the author of botanical works illustrated by great numbers of figures, of which there are above 2000 in his 'Plantarum Historia,' a folio work published at Antwerp, in 1576, and still referred to by critical writers on systematic botany. But his name deserves mention more particularly as that of the first naturalist who devised the present method of arranging plants in their natural orders, rudely indeed, but with sufficient distinctness. Lobel died at Highgate, near London, in 1616. The genus *Lobelia* was dedicated to him by Linnæus.

LOBELIA'CEÆ, an important natural order of monopetalous Exogens. The species principally inhabit the warmer parts of the world. They abound in a milky juice, which in all is acrid, and in some so intensely so as to produce dangerous or even fatal consequences when applied to the surface of the body or taken internally. Among the most virulent is the *Hippobroma longiflorum*, a West Indian species, and the *Lobelia Tupa*, a Chilian plant now common in gardens. Certain species however have proved, in skilful hands, valuable curative agents, especially the *Lobelia inflata*, or Indian tobacco, which is an annual plant, growing in most districts of North America, of which the oval obtuse leaves are used in medicine. The action on the human system is nearly the same as that of tobacco when chewed, producing a copious flow of saliva, and, if swallowed in a considerable dose, causing great relaxation of all muscular structures, including the heart and arteries, accompanied with debility and cold perspirations, and also paleness of the surface. In large doses it proves decidedly poisonous. It frequently acts as an emetic and expectorant when given in small and regulated doses.

LOBO, JEROME, a native of Lisbon, entered the order of the Jesuits, and was ordered to the missions in India. He arrived at Goa in 1622, and volunteered for the mission to Abyssinia. He remained at Fremona for several years as superintendent of the missions in that kingdom, but was compelled to fly with the rest of the Portuguese in 1634, on account of the persecutions which they experienced from the native government and the Abyssinian priests. He exerted himself with the utmost vigour and perseverance to re-establish the influence of the Roman Catholics in Abyssinia, but, meeting with neither assistance nor encouragement from either the court of Spain or the Pope, he was obliged to relinquish the attempt.

In 1640 he returned to India, and became rector and afterwards provincial of the Jesuits at Goa. In 1656 he returned to Lisbon, and in 1659 he published the narrative of his Journey to Abyssinia, under the title of 'History of Ethiopia.' The whole was translated into English, from the French of the Abbé Le Grand, by Dr. Johnson in 1735. Lobo died at Lisbon in 1678.

LOBSTER. [ASTACUS.]

LOCARNO. [TICINO.]

LOCHABER. [INVERNESS-SHIRE.]

LOCHES. [INDRE-ET-LOIRE.]

LOCHMABEN. [DUMFRIESSHIRE.]

LOCK, a fastening in which a moveable bolt may be projected by the action of a key, introduced into the lock in such a manner that it cannot be returned to its original position, so as to release the door, cover, or other article to which the lock is applied, excepting by another application of the key. In some locks the bolt is projected by the action of a spring; in others there are two or more bolts, one of which only is under the control of the key, the others being moved by handles; while in another class of locks two o

more bolts are shot or projected by the action of the key alone. *Padlocks* are a kind of detached lock in which a curved bar of iron, pivoted to the lock at one end, may be passed through a staple, and then so secured by shooting the bolt into a cavity in its free end, which is inserted into the lock for the purpose, that it cannot be removed from the staples or links through which it has been passed.

By far the greater part of the almost innumerable ingenious contrivances for rendering locks inviolable may be classed under one of two systems of security. The first consists in the insertion in the lock of fixed obstacles, commonly called *wards*, which prevent the entrance of any key which is not formed with corresponding openings, so as to thread its way among them, and thus render the bolt inaccessible to any but the proper key; while the second consists in the use of moveable impediments (which in their most general form are called *tumblers*) to the motion of the bolt itself, the security arising from the difficulty of bringing these moveable impediments, by the use of any but the proper key, to the actual and relative positions necessary to allow free motion to the bolt. In many locks both of the above means of security are used.

The key of an ordinary lock consists of a cylindrical shank with a loop-shaped handle at one end, and a piece called the *bit* projecting from it at a right angle at or near the other end. The bit end of the shank is hollow or solid, according as the lock may be opened from one side only, or from two. The projecting bit, after being introduced into the body of the lock through the key-hole, is turned round within the lock until it comes in contact with a part of the bolt which is so shaped that the bit of the key cannot pass it, to complete its revolution, without shooting the bolt either backwards or forwards, as the case may be. When thus moved, the bolt is retained in its position by a spring, or some other means, until it is again moved by the reverse action of the key.

The varied and highly ingenious inventions of Chubb, Bramah, Mordan, and other lock-makers, depend on various combinations of the above two contrivances, the *ward* and the *tumbler* aided by peculiarities in the form of the key.

As a means of security somewhat differing from any of the above, and affording certain advantages peculiar to itself, we may notice the *permutation* or *combination* principle, of which the simplest application is in a kind of padlock often termed a puzzle-lock, which opens without a key, but is regarded rather as an ingenious toy than as an available substitute for locks of the more usual construction.

Some locks have been made in which the action depends on the key being a powerful magnet. In others the difficulty of opening is increased by requiring a peculiar method of applying the key; but, in addition to the circumstance that the secret must be known to several persons, these contrivances have the disadvantage of being very inconvenient in use. In one invention a key with two bits, and requiring eight or nine distinct movements in the act of unlocking, is used with a double lock, capable of shooting two distinct bolts. Many contrivances have been effected for attaching an alarum to locks, by which the introduction of a false key should ring a bell or fire a pistol. But most of these contrivances are curiosities rather than conveniences. In the compound-locks for iron safes, which often throw out two or three bolts in every direction, that is to say, on each side, and towards the top and bottom of the door, these are usually but so many branches of four massive pieces of iron, capable of being simultaneously projected by a handle in the centre of the door, the actual lock being but small, and merely intended to move an apparatus by which the great bolts are themselves locked or held fast; so that the key need not bear any proportion to the magnitude of the bolts by which the door is secured.

LOCK, MATTHEW, an English composer of great and deserved celebrity, was born in Exeter in or about the year 1635. He was instructed in music by Wake and Edward Gibbons.' His first productions were concerted pieces for two or three instruments, and a few glees. Lock was the first English composer for the stage. He set the instrumental music in the 'Tempest,' as performed in 1673, and in the same year composed the overture, airs, &c., to Shadwell's 'Psyche.' His sacred compositions, some of which appear in the 'Harmonia Sacra,' and in Boyce's 'Collection of Cathedral Music,' are quaint, though they show that he was a master of harmony. But his 'Music in Macbeth' is that on which his fame now chiefly rests. Lock died in 1677, having a few years before become a member of the Roman Catholic church.

LOCKE, JOHN, was born at Wrington, near Bristol, on the 29th August, 1632. Locke was placed at Westminster School, from which he was elected in 1651 to Christ Church, Oxford. He applied himself at that university with great diligence to the study of classical literature, and by the private reading of the works of Bacon and Descartes he sought to acquire that aliment for his philosophical spirit which he did not find in the Aristotelian scholastic philosophy, as taught in the schools of Oxford. He adopted the profession of medicine, which however the weakness of his constitution prevented him from practising.

In 1664 Locke visited Berlin as secretary to Sir W. Swan, envoy to the Elector of Brandenburg; but after a year he returned to Oxford, where he accidentally formed the acquaintance of Lord Ashley, afterwards Earl of Shaftesbury, and Locke accepted the invitation of this nobleman to reside in his house. In the house of Shaftesbury Locke became acquainted with some of the most eminent men of the day, and was introduced to the Earl of Northumberland, whom, in 1668, he accompanied on a tour into France. Upon the death of the earl, he returned to England, where he again found a home in the house of Lord Ashley, who was then chancellor of the exchequer, and Locke was employed to draw up a constitution for the government of Carolina,

which province had been granted by Charles II. to Lord Ashley with seven others.

In 1672, when Ashley was created Earl of Shaftesbury and made lord chancellor, Locke was appointed secretary of presentations. This situation he held until Shaftesbury resigned the great seal, when he exchanged it for that of secretary to the Board of Trade, of which the earl still retained the post of president.

In 1675 Locke visited France, and resided at Montpelier. In 1679 he was recalled to England by the Earl of Shaftesbury, who had been restored to favour and appointed president of the council. Six months afterwards however he was again disgraced, and was ultimately compelled to leave England in 1682, to avoid a prosecution for high treason. Locke followed his patron to Holland, where, even after the death of Shaftesbury, he continued to reside; for the hostility of the court was transferred to Locke, and his name was erased, by royal mandate of the 16th of November, 1684, from the number of the students of Christ Church. During his residence in Holland he became acquainted with Limborch, Leclerc, and other learned men attached to the cause of free inquiry both in religion and politics. He had commenced his 'Essay concerning Human Understanding' in 1675, which he completed in 1687; and he made an abridgment of it, which was translated into French by Leclerc. On the Revolution of 1688, Locke returned to England in the fleet which conveyed the Princess of Orange. Locke now obtained, through the interest of Lord Mordaunt, the situation of commissioner of appeals, with a salary of 200*l.* a year. In 1690 his reputation as a philosophical writer was established by the publication of his 'Essay concerning Human Understanding,' which met with immense success. Many circumstances contributed to its success: among others, the personal celebrity of the author as a friend of civil and religious liberty, and the attempt made at Oxford to prevent its being read in the colleges. Numerous editions passed rapidly through the press, and translations were made of it into Latin and French. In the same year Locke published two treaties on Government. These essays were intended generally to answer the partisans of the exiled king, who called the existing government a usurpation, but particularly to refute the principles advanced in the 'Patriarcha' of Sir Robert Filmer. In the second essay Locke maintains that the legitimacy of a government depends solely and ultimately on the popular sanction, or the consent of men making use of their reason to unite together into a society or societies. The philosophical basis of this treatise formed a model for the 'Contrat Social' of Rousseau, the source of great errors and infinite miseries to mankind.

The air of London disagreeing with Locke, he accepted the offer of apartments in the house of his friend Sir Francis Masham, at Oates in Essex. In this retirement he wrote a third letter on Toleration, which called forth a reply from a former antagonist of Locke on the subject; in answer to whom a fourth letter, in an unfinished state, was published after the death of Locke. In 1693 he first gave to the world his 'Thoughts upon Education,' to which likewise Rousseau is largely indebted for his 'Emile.' Though appointed one of the commissioners of trade and plantations in 1695, Locke still found leisure for writing; and he was principally engaged in writing on Christianity.

Locke's health had now become so impaired, that he resigned his office of commissioner of trade and plantations, and he refused a pension which was offered him. From the time of his retirement he resided at Oates, and devoted the remainder of his life to the study of the Holy Scriptures. He died on the 28th of October, 1704, in the 73rd year of his age.

The personal character of Locke was in complete harmony with the opinions which he so zealously and so ably advocated. Truly attached to the cause of liberty, he was also willing to suffer for it. Perfectly disinterested, and without any personal objects at stake in the political views which he adopted, he never deviated from moderation; and the sincerity of his own profession rendered him tolerant of what he believed to be the conscientious sentiments of others.

Locke has a happy facility in expressing his meaning with perspicuity in the simplest and most familiar language. Clearness indeed is the leading character of his composition, which is a fair specimen of the best prose of the period. His style however is rather diffuse than precise, the same thought being presented under a great variety of aspects, while his reasonings are somewhat prolix, and his elucidations of a principle occasionally unnecessarily prolonged. These are faults however which, though they may materially detract from the merits of his composition as a model of critical correctness, have nevertheless greatly tended to make his 'Essay concerning Human Understanding' a popular work. An analysis of this work would be out of place here. The services of Locke to philosophy are rated very high by his admirers. His notions of law and government were confused; and many of his doctrines are fundamentally false, and lead directly to dangerous consequences.

The works of Locke have been collected and frequently published in 3 vols. fol., and a Life of him was written in 1772; but the most complete and best edition is that in 10 vols 8vo., London, 1801 and 1812. A Life of Locke was published in 1829, by the late Lord King, a lineal descendant of his sister.

LOCKERBIE. [DUMFRIESSHIRE.]

LOCMARIA. [BELLE-ILE-EN-MER.]

LOCKS. [CANALS.]

LOCRIS was a name employed to designate the country of three distinct Grecian tribes, the Locri Epicnemidii, the Locri Opuntii, and the Locri Ozolæ.

The Locri Epicnemidii and Locri Opuntii inhabited the eastern coast of Phocis, and were separated from the latter country by a mountain range which stretches from Mount Œta to the borders of Bœotia. The northern part of this range was called Cnemis, whence the Epicnemidii Locri derived their name. The Opuntii Locri de-

rived their name from Opus, their chief town on the borders of Bœotia.

The Locri Ozolæ were bounded on the west by Ætolia, on the north by Doris, on the east by Phocis, and on the south by the Corinthian Gulf. The principal towns of western Locris were Amphissa, now Salona, at the head of the Crissæan Gulf, and Naupactus, now Lepanto.

The Locri Epizephyrii, or Western Locri, who inhabited the south-eastern extremity of Italy, were a colony, according to Ephorus, of the Locri Opuntii, but, according to Strabo, of the Locri Ozolæ. The Locri Epizephyrii are said to have been the first Greek people who had a written code of laws, which was drawn up by Zaleucus about B.C. 664.

LOCUS. This word, or the Greek *τόπος*, signifying simply *place*, was used by the first geometers to denote a line or surface over which a point may travel, so as always to be in a position which satisfies some given condition. Thus, suppose it required to find the position of a point at which a given line subtends a right angle: the answer is, that the number of such points is infinite; for that any point whatsoever upon the surface of a sphere which has the given line for its diameter is such a point as was required to be found. This would be expressed as follows:—the *locus* of the point at which a given line subtends a right angle is the sphere described on the given line as a diameter. If however the point were required to be in a given plane, its locus would no longer be the whole sphere, but only that circle which is the common section of the sphere and the given plane.

LOCUST (the *Gryllus migratorius* of Linnæus, *Locusta migratoria* of modern entomologists), a well-known insect, belonging to the order *Orthoptera*, section *Saltatoria*, and family *Locustidæ*. Locusts are endowed with great strength for leaping and flying, and, being gregarious, are thus enabled to commit great devastation, so that, when a swarm has destroyed the vegetation of one district, they are enabled to take flight to and traverse another, even though at a considerable distance. The migratory locust has occasionally visited England. In Southern Europe, the East, and Northern Africa, this species and its allies are exceedingly destructive, the swarms being so vast as to destroy all vegetation, whilst the putrefying carcasses of their dead infect the air. The Arabs and people of Nigritia use these insects as food. For full details of the habits, &c. of the Locusts, see Kirby and Spence, *Introd. to Entomology*.

Besides the genus *Locusta*, the following are contained in the family *Locustidæ*, viz.—*Gomphocerus*, *Acrydium*, *Pneumora*, and *Proscopia*.

The other families of the *Saltatoria* are *Achetidæ* (Examples, the Mole-Cricket and the House-Cricket), and *Gryllidæ* (Example, the Great Green Grasshopper, *Acrida viridissima*).

LOCUST TREE is the *Robenia pseudacacia* of botanists, a North American forest-tree. The same name has also been given to the *Ceratonia Siliqua*, or Carob Tree.

LODDON. [BERKSHIRE.]

LODE'VE. [HE'RAULT.]

LODGE, THOMAS, is supposed to have been born about 1556. He was entered at Trinity College, Oxford, in 1573, took a degree, and then, going to London, became an actor and play-writer. About 1580, in an answer to Gosson's 'School of Abuse,' he wrote a 'Defence of Stage-plays,' which was suppressed by authority, only two copies of which exist. His 'Alarum against Usurers' was printed in 1584. In the same year he was a student of Lincoln's Inn. Afterwards, it has been conjectured, he became a soldier. He accompanied the expeditions of Clarke and Cavendish. He is usually identified with a Doctor Lodge, who took his degree in medicine at Avignon, and printed in 1603 'A Treatise on the Plague,' and in 1614 a translation of the 'Works of Lucius Annæus Seneca.' Lodge is believed to have died of the plague in 1625.

He was a voluminous and versatile writer: he wrote several novels, volumes of verses, and miscellaneous pamphlets; and he was a distinguished contributor to the drama in the years immediately preceding the appearance of Shakspere. One of his novels is entitled 'Rosalynde: Euphues Golden Legacie; found after his death in his cell at Silexedra,' 1590, 4to.; reprinted in Mr. Collier's 'Shakespeare's Library,' 1840. From this novel Shakspere borrowed the grouping of the characters, and many of the strokes of portraiture, for his 'As You Like It.'

LODGINGS, THE LAW OF, differs according to the custom which regulates each particular case from the general rules of law between landlord and tenant.

As the length of the term for which lodgings are let seldom exceeds or even extends to a year, it is rarely the case that a six months' notice to quit is necessary. This can only happen when the tenancy is from year to year. But, if the taking be for less than a year, as for a quarter, a month, or a week, which may be presumed from the rent being paid at the lapse of those terms, or other circumstances, the length of notice will be regulated accordingly, as a month for a month, and a week for a week, the expiration of the notice being that of the term. Unless the lodger gives up possession and pays the rent for a whole term in advance, notice must always be given, and he will not be released from such a necessity merely from an apprehension, however just, of his goods being distrained for his landlord's rent.

The 12 Vict. c. 11, which modifies the 7 & 8 Geo. IV. c. 29, as to the offence of simple larceny, &c. [LARCENY], leaves the 45th section of the latter act unaltered as to tenants and lodgers who steal a chattel or fixture above the value of 5*l.* from the house or lodging which they occupy.

LODI-E-CREMA, one of the provinces of Austrian Italy, is bounded N. by the Milanese and Bergamo, W. by Pavia, S. by the Po, which divides it from the duchy of Parma and Piacenza, and E. by Cremona and Brescia. The province is part of the great plain of the Po, and is watered by the Adda, Serio, Lambro, and other affluents of that river. Until the end of the last century, this province was divided into two small ones, which were separated by the Adda, namely,

Crema to the east of that river, which belonged to the republic of Venice, and Lodi west of the Adda, which was part of the duchy of Milan.

The length of the province is 30 miles from E. to W., and above 27 miles from N. to S. The area is 720 square miles, and the population 212,000. The soil is partly sown with corn, flax, and pulse, and partly planted with the vine and mulberry-trees; but the best part consists of artificial meadows, rendered productive by irrigation. On these are fed a great number of cows, from the milk of which the rich cheese is made, known in Lombardy by the name of Lodigiano, but called, by an odd misnomer, in the rest of Europe by the name of Parmesan. Great attention is paid to rearing of silk-worms, and a good deal of coarse raw silk is brought to market. A considerable number of horses and pigs are bred. In every commune there is an elementary school.

Lodi, the capital of the province, is a well-built episcopal town, on the right bank of the Adda, with 15,890 inhabitants, who manufacture pottery, delft, and silks. Lodi has a royal lyceum and a gymnasium, a theological seminary, an orphan asylum, two hospitals, a savings' bank, a public library of 15,000 volumes, and a Monte-di-Pietá. The most interesting structures in Lodi are the church of L'Incoronata, and the stone bridge over the Adda, famous for the defeat of the Austrians by Bonaparte.

Crema, an episcopal town on the right bank of the Serio, is a well-built place, with a gymnasium and 9000 inhabitants, who manufacture linen and linen-thread. *Codogno*, S.E. of Lodi, is a flourishing town with 8000 inhabitants, a theatre, and a considerable trade in cheese, silk, &c. *San-Colombano*, at the foot of a hill near the right bank of the Lambro, has a population of 5000.

LOFODEN ISLANDS. [TRONDHIEM.]

LOG and LOG'LINE. This is the apparatus by which the velocity of a ship's motion through the water is measured. The log is a flat piece of wood, loaded with lead at one of its edges to make it float upright; and to this is attached a line about 150 fathoms long, divided into equal lengths by little pieces of knotted twine rove into it. These divisions begin about twenty or thirty yards from the log, where a piece of red rag is usually fastened, in order to show the place readily. From the lee quarter of the vessel the log is thrown into the sea, where it is supposed to remain stationary during the operation, and the line is veered out at least as fast as the ship sails. As soon as the red rag leaves the reel, a half-minute glass is turned, and, when the sand is all run down, the reel is stopped. Then, by measuring the quantity of line run out, the distance sailed by the vessel in half a minute is known, and by calculation its rate of going per hour. The usual way of dividing the line is to place the knots at distances of fifty feet from each other. Now, as 120 times half a minute make an hour, and 120 times fifty feet make almost a geographical mile, so many knots will run from the reel in one experiment as the vessel sails miles in the hour; from this comes the expression of a vessel's sailing so many knots an hour—meaning miles.

LOG-BOARD and LOG-BOOK. The former is either a large piece of plank, blackened, ruled, and prepared for writing on with chalk, or else a slate with divisions scratched upon its surface; and the latter is the blank book in which are inserted daily the contents of the board: these are, the course of the vessel, the direction of the wind, and the distance run, as given by the log: in the book is also inserted a record of the different events which occur during the voyage.

The place of the ship, thus obtained by the log and compass, is technically termed Dead Reckoning; and this is used until an opportunity is afforded of taking observations for latitude and longitude, or until some place whose position is known comes in sight; the true place of the ship is then substituted in the log-book for that obtained by dead reckoning, and from that place subsequent reckonings are made until another observation is obtained.

LOGAN, JOHN, was born at Fala, in the county of Edinburgh, in 1748. He was the son of a small farmer, and, being destined to the clerical profession, was educated in the University of Edinburgh, and became one of the ministers of Leith. In 1770 he had edited the posthumous poems of his friend Michael Bruce, incorporating with them some pieces which he claimed (and probably justly) as his own, and among which was the well-known 'Ode to the Cuckoo.' His poetical talents were further shown by several pieces of sacred poetry. In 1779, patronised by Blair, Robertson, and other literary men, he delivered in Edinburgh a course of Lectures on the 'Philosophy of History.' His poetical endowments, strongly lyrical in their tendency, were the highest he possessed. In 1783 he printed, and caused to be acted in Edinburgh, a tragedy called 'Runnamede,' which had been rehearsed at Covent Garden, but was refused a licence by the Lord Chamberlain. This publication brought on him the anger of the Presbyterians; and these and other annoyances induced him in 1785 to quit his parochial charge, and repair to London. There he eked out his livelihood by literary labour. He died in London Dec. 28, 1788. His friends Drs. Blair, Robertson, and Hardy, published a volume of his Sermons in 1790, and a second in 1791. These sermons are among the most eloquent that the Scottish church has produced.

LOGARITHMS. The etymology of this word is λογῶν ἀριθμος, *the number of the ratios.*

The early history of logarithms will be found at length in the preface to Dr. Hutton's Tables; in the 'History of Logarithms' contained in the first volume of Dr. Hutton's 'Tracts;' in Delambre's 'Histoire de l'Astronomie Moderne,' vol. i. pp. 491–568.

The idea of logarithms originally arose (in the mind of Napier) from the desire to make addition and subtraction supply the place of multiplication and division. A table, in which are registered 1, a, a^2, a^3, &c., supplies this desideratum to a certain extent; for, since a^x multiplied by a^y gives a^{x+y}, we find the product of the first two by adding their exponents, and looking in the table

for the $(x+y)$th power. Thus, for the set 1, 2, 4, 8, 16, &c., a table of logarithms is easily constructed, a specimen of which is as follows:—

Num.	log.	Num.	log.	Num.	log.
1	0	32	5	1024	10
2	1	64	6	2048	11
4	2	128	7	4096	12
8	3	256	8	8192	13
16	4	512	9	16384	14

Thus, to multiply 64 and 128, that is, to find the product of the sixth and seventh powers of 2, we must take the $(6+7)$th or 13th power, which, from the table, is 8192.

Such a table would be useless for general purposes, since it omits more numbers than it contains. But, if we take a very little greater than unity, the powers will increase but slowly, and every whole number within given limits may be made either a power of a, or very near to a power of a. Suppose, for instance, that we wish for a table of logarithms which shall contain among its numbers either every whole number under a million, or a fraction within h of every number under a million. Extract the square root of one million, the square root of that square root, and so on, until, say the rth root of one million has been extracted, and let this rth root be $1+t$. It is obvious that this extraction may be carried on until t is as small as we please. Consequently $(1+t)r$ is a million, and every lower power of $1+t$ is less than a million, so that (m standing for a million) no two consecutive powers differ by so much as the difference of m and $m\,(1+t)$, or by so much as mt. If, then, we proceed with the extraction until mt is less than h, we shall have t of the degree of smallness required: that is, since every whole number less than m lies between two powers of $1+t$, having exponents less than r, *à fortiori* every such whole number must be within h of some power of $1+t$.

This is in fact the first view which was taken of the method of constructing tables of logarithms; and it must be remembered that Napier was not in possession of the modern way of expressing the powers of quantities. On the methods of facilitating such enormous computations, and on the details which still remained for the first calculators after they had applied all the analysis which they had, we have not here to speak; but we shall now show how the table may be formed by mere labour, and how the word logarithm arises.

Let us suppose that our system is to be such that, 0 being the logarithm of 1, a hundred thousand shall be the logarithm of 10. If the hundred thousandth root of 10 be extracted and called $1+t$, it would be found that 2 is very nearly the 30103rd power of $(1+t)$, that 3 is very nearly the 47712th power of $1+t$, and so on. If, then, beginning with 1, we increase it in the ratio of 1 to $1+t$, giving $1+t$; if we increase this in the ratio of 1 to $1+t$, giving $(1+t)^2$, and so on, it appears that we shall reach 2 (or very near to it, one way or other), when 30103 such ratios have been taken; or, if we pass from 1 to 10 by 100,000 steps, increasing each time in the same ratio, we shall come nearest to 2 in 30103 steps, which is therefore the number of times the increase is made in a certain ratio, or the number of the ratios, the λογῶν ἀριθμος, or the logarithm of 2.

In such a table it must of course follow that the logarithm of a product is exactly or very nearly the sum of the logarithms of the factors, since, for instance, 2 being $(1+t)^{30103}$ and 3 being $(1+t)^{47712}$ very nearly, 6 must be very nearly $(1+t)^{77815}$. Nor is this property altered, if we divide or multiply all the logarithms by the same number. If, then, we divide every logarithm by 100000, the logarithm of 10 becomes 1, that of 2 becomes .30103, and that of 3 becomes .47712, as in the common tables.

It was evident from the first that the connection between a logarithm and its number must be of the following kind: when the logarithm increases in arithmetical progression, the number must increase in geometrical progression; so that, if a and $a+b$ be the logarithms of A and AB, then $a+2b$, $a+3b$, &c., must be the logarithms of AB^2, AB^3, &c. Several mathematicians had formed this conception; but the preliminary difficulty which stopped their progress was their being unable to present the series of natural numbers (or fractions of a high degree of nearness to them), in the shape of terms of a geometrical progression. The great merit of Napier is threefold: first, he distinctly saw that all numbers, within any given limit, may be either terms, or as near as we please to terms, of a geometrical progression; secondly, he had the courage to undertake the enormous labour which was requisite for the purpose; thirdly, he made an anticipation of the differential calculus in developing the primary consequences of the definition.

It must be admitted that Briggs, by his construction of the decimal system, divides with Napier the merit of inventing logarithms, considered as an instrument of calculation. In the Naperian system the table must either be carried to an enormous length, or whole numbers only must have logarithms, and every logarithm of a fraction will require two entries of the table and a subtraction. But in Briggs's system the logarithm of every decimal fraction can be found by one entry of the table, and one inspection of the fraction.

The peculiarity of this system (the base of which is 10) is as follows:—Every number or fraction is either a power of ten, positive or negative, or lies between two powers of ten. The powers of ten are ranged in the following table:—

.....		
$10^{-4} = .0001$	$10^0 = 1$	$10^1 = 10$
$10^{-3} = .001$		$10^2 = 100$
$10^{-2} = .01$		$10^3 = 1000$
$10^{-1} = .1$		$10^4 = 10000$
		.....

From which the following rules may easily be obtained: A number which has m figures before the decimal point lies between 10^{m-1} and 10^m, and its logarithm therefore lies between $m-1$ and m, or it is $m-1+$ a fraction less than unity. Also, if a fraction be less than unity, and if its first significant figure lie in the nth decimal place, this fraction lies between 10^{-n} and $10^{-(n-1)}$;

so that its logarithm is $-n+$ a fraction less than unity. Now the convenience of Briggs's system lies in this, that the fraction less than unity, which is a part of every logarithm, does not depend on the position of the decimal point, but entirely upon the significant figures: the reason being, that an alteration of the position of the decimal point, being a multiplication or division by some whole power of 10, alters the logarithm by the addition or subtraction of a whole number. This question is discussed in every treatise on the mode of using logarithms.

LOGGAN, DAVID, was born at Danzig, in 1635. He came to England during the Commonwealth, and spent some time in engraving heads in London. But his first work of consequence in this country was a set of plates of the colleges of Oxford—'Oxonia Illustrata,' for the sale of which he had fifteen years' privilege; he executed afterwards a similar series of the colleges of Cambridge. He also engraved on eleven folio plates 'Habitus Academicorum Oxoniæ à Doctore ad Servientem.' Loggan is himself entered on the books of the University; in the matriculation registry there is the following entry—'David Loggan, Gedanensis, Universitate Oxon., Chalcographus, July 9, 1672.'

He died at his house in Leicester-Fields in 1693. Loggan engraved many portraits of illustrious persons in the time of Charles II., many of the drawings of which were executed in lead by himself from the life. He engraved also three portraits of Charles II.

LOGIC. [ORGANON.]

LOGROÑO. [CASTILLA-LA-VIEJA.]

LOGWOOD, or CAMPEACHY WOOD, imported from the West Indies for the purposes of the dyer, is the wood of a low tree called *Hæmatoxylon Campechianum*. It belongs to the natural order *Leguminosæ*, and to the section *Cassieæ*. The wood is hard enough to take a fine polish, and is very durable. Its colouring matter is dissolved both by water and alcohol, and it is principally derived from the presence of a peculiar body, to which Chevreul, who discovered it, gave the name of *hematin* or *hæmatoxyline*. Logwood is employed by the calico-printer to give a black or brown colour, the cloth being always first impregnated with alum mordant, and thus black is obtained. Iron mordant and logwood also yield a black, but it is not so good as with the alum mordant. Cloth with the alum mordant, dyed in a mixture of logwood and madder, has a fine brown colour fixed upon it. Logwood is also employed in the preparation of some lakes. The logwood imported into Great Britain in 1848 amounted to 23,192 tons.

LOIR, River. [LOIR-ET-CHER.]

LOIR, NICOLAS, was born at Paris in 1624. His father was an eminent jeweller, and he placed Nicolas with Sebastien Bourdon, and sent him afterwards, in 1647, to complete his studies in Rome. Here Loir studied chiefly the works of N. Poussin, and so carefully that in some instances it is said to be scarcely possible to distinguish Loir's copies from the originals. He had great facility of execution, and excelled in various styles, as history, landscape, and architecture. He also composed with elegance, and his colouring is very agreeable; but his design is somewhat affected, and is not always vigorous or correct in its outline.

In 1663 he was elected a member of the French Academy of Painting. His masterpiece is considered 'Cleobis and Biton drawing their Mother in a Chariot to the Temple of Juno,' from the story of Herodotus (i. 31). He died at Paris, rector of the Academy, in 1679.

LOIR-ET-CHER, a department in France, formed chiefly out of the old province of Orléanais, is bounded N. by the department of Eure-et-Loir, E. by those of Loiret and Cher, S. by that of Indre, and W. by Indre-et-Loire and Sarthe. It extends from 47° 13′ to 48° 6′ N. lat., and from 0° 38′ to 2° 14′ E. long.; its length from N.W. to S.E. is 80 miles, the average width is about 38 miles. The area is 2417 square miles, and the population 256,833; which gives 106·261 to the square mile, being 67.489 below the average per square mile for all France.

The surface presents a number of elevated and extensive plains, unbroken by any considerable hills, and sloping with very gentle inclination south-westwards. The department is divided into two pretty equal parts by the Loire, along the banks of which run two chains of low hills, that have their slopes covered with vineyards and orchards. The district N. of the Loire is drained by the *Loir*, which, rising in the S.W. of Eure-et-Loir, flows S.E. as far as Bonneval, and thence nearly S. past Châteaudun to Vendôme, in this department. From Vendôme it runs nearly W., crossing the south of the department of Sarthe, and, reaching the boundary below La-Flèche, it enters the department of Maine-et-Loire, taking a south-western direction to its junction with the Sarthe on the left bank, nearly opposite the point where that river is joined by the Mayenne, about 5 miles N. of Angers. The principal feeders of the Loir are the Ozane, the Yère, and the Braye on the right bank, and the Conie on the left. The whole length of the river is about 160 miles, 65 of which are navigable. The district S. of the Loire is drained by the CHER, its feeder the Sauldre, and by the Beuvron and Cosson, which throw their waters into the Loire, near the village of Candé, below Blois. There are numerous ponds along the left bank of the Loire; and the south-east of the department, which is formed out of part of the old district of Sologne, now included in the arrondissement of Romorantin, presents a vast marshy plain, which contains many hundreds of ponds. Roadway accommodation is afforded by 6 royal, 16 departmental, and 11 parish roads. The department is crossed by the Orléans-Tours Railroad, which runs through Blois and along the right bank of the Loire; and by the Orléans-Vierzon Line, which has 32 miles of its length in the south-east of this department.

The soil in the north-east of the department, which includes a portion of the Beauce district, consists of a dark rich loam; in the south-east the arable lands are composed of strong clay and sand; along the Cher the soil is calcareous. Agriculture is in rather a forward state; large quantities of

bread-stuffs are raised, much more than supplies the home consumption. Of wine, the annual produce is about 13,200,000 gallons, a large portion of which is distilled into brandy. The department yields, besides excellent fruits and vegetables, beet-root, hemp, &c. The Sologne sheep are extolled for the fineness of their wool; but the horses of that district, though hardy, are small and ill-formed. Black cattle are of inferior breed. The arrondissement of Vendôme is famous for its breed of draught horses. The rivers and ponds abound in fish; the Sologne marshes and ponds supply also a considerable quantity of good leeches. The department contains a good deal of natural and artificial grass-land; and in the arrondissement of Romorantin there are large pine woods. The climate is in general mild and healthy, except in the marshy district of Sologne.

Iron mines are worked; alabaster, building stone, and gun-flints are quarried; marl and potters' clay are found.

The manufactures consist of coarse woollens, blankets, swanskin, cotton cloth, hosiery, leather gloves, beet-root sugar, woollen yarn, leather, glass, and earthenware. About 160 fairs are held annually. The department contains 465 wind and water mills, 61 iron foundries and smelting furnaces, and 194 factories.

The area of the department is 1,546,864 acres, distributed among 93,727 proprietors, and into 1,314,394 parcels. Of this surface, 913,401 acres are arable land; 77,505 are grass and meadow land; 65,710 are under vineyards; 201,818 are covered with woods and forests; 200,153 acres consist of heaths and barren moors; 34,161 acres of ponds, rivers, canals, &c.; and 19,030 acres are under orchards, nurseries, gardens, and plantations of different kinds.

The department is divided into three arrondissements, which, with their subdivisions and population, are as follows:—

Arrond.	Cantons.	Communes.	Pop. in 1846.
Blois	10	140	128,587
Romorantin . .	6	52	49,200
Vendôme . . .	8	110	79,046
Total . .	24	302	256,853

Of the arrondissement of Blois, and of the whole department, the capital is Blois. *Mer*, N.E. of Blois, on the right bank of the Loire, has 3686 inhabitants, who manufacture leather, and trade in wine, brandy, and vinegar. Close to Mer is *Menars*, where there is a very fine château, now belonging to Prince de Chimay, who has established a college in it. *Montrichard*, formerly an important fortress, defended by a strong castle, now in ruins, is situated on a hill on the right bank of the Cher, 18 miles S. from Blois, and has 2526 inhabitants. The ancient walls of the town, which are pierced by 4 gates and flanked with towers, are still in a good state of preservation. Near *St.-Aignan*, a small town on the left bank of the Cher, are the great gun-flint quarries from which the French armies were supplied.

In the arrondissement of Romorantin, the chief town, *Romorantin*, stands at the junction of the Morantin with the Sauldre, 24 miles S.E. from Blois, and has tribunals of first instance and of commerce, a college, and 7259 inhabitants. The town, formerly ill built, has been considerably improved of late years, the streets having been widened and laid out more regularly, houses erected in a modern style, and the roadways well paved. It has important manufactures of cloth and woollen stuffs, several spinning factories, tanyards, and parchment mills. At the siege of this town by the Black Prince, in 1366, cannon are said to have been first used. *Selles-sur-Cher*, situated in a fertile country, 10 miles S.W. from Romorantin, on the Cher, which is here spanned by a fine bridge, has 4252 inhabitants, who manufacture cloth, and trade in corn, wine, &c. At one end of the town stands a fine château, erected by Philippe de Bethune, the brother of Sully.

In the arrondissement of Vendôme, the chief town, Vendôme, prettily situated on the slope of a vine-clad hill, above the Loir, which here divides into two branches, stands 19 miles N.W. from Blois, and has a tribunal of first instance, a college, and 9470 inhabitants, who manufacture woollen stuffs, gloves, cotton yarn, calico, leather, and paper. The town is well built. On the height above it are the ruins of the old castle of the dukes of Vendôme, from which there is a fine view of the scenery of the Loir. Among the more remarkable structures are the church of La-Sainte-Trinité, the Benedictine monastery, now used as a barrack, the desecrated church of St.-Martin, now converted into a corn market, the college buildings, and the theatre. *Mondoubleau*, a small place of 1671 inhabitants, is prettily situated on a hill above the Graisne, a small feeder of the Braye, 15 miles N.W. from Vendôme. A fine old castle, with walls, towers, and ditches, still nearly entire, stands above the town, and formed one of the chain of fortresses that defended the frontier of the old province of Maine. *Montoir*, a pretty town on the right bank of the Loir, and at the foot of a hill crowned by the château of St.-Outrille, has 3306 inhabitants, who manufacture linen, woollen hosiery, and leather. The church of St.-Gilles, the interior of which is richly ornamented with frescoes, and the handsome square in the centre of the town, are the most remarkable objects. *Savigny*, near the left bank of the Braye, in the north-west of the department, has a population of 3065.

The department forms the see of the bishop of Blois, is included in the jurisdiction of the Cour Royale and University Academy of Orléans, and belongs to the 4th Military Division, of which Tours is head-quarters. It formerly returned 3 members to the Chamber of Deputies; it now has 6 representatives in the National Assembly.

(*Dictionnaire de la France; Annuaire pour l'An* 1849.)

LOIRE (the *Liger* or *Ligeris* of the Romans), a river in France, the basin of which is bounded E. by the Cévennes; N. by the mountains of Morvan, the heights of Beauce, and the Menez

Mountains; and S. and S.W. by the Margeride Mountains, and the volcanic group of Auvergne, with its ramifications westwards to the Atlantic. The limits thus described include a fourth part of France. The greatest length of the basin from N.W. to S.E. is 370 miles; its greatest breadth, 224 miles. Its area is estimated at 50,783 square miles.

The Loire rises in Mont Gerbier-des-Joncs, one of the Cévennes in the neighbourhood of Mount Mézin, in the department of Ardèche. The general direction of its course is at first north, then north-west to Orléans, where it turns westward, and continues in this direction to its entrance into the Atlantic, 36 miles below Nantes. The number of streams received by the Loire is very great; its navigable feeders from the right bank are the Arroux, the Maine (formed by the junction of the Mayenne and the Sarthe); from the left—the Allier, the Loiret, the Cher, the Indre, the Vienne, the Thouét, the Sèvre-Nantaise, and the Achenau, all of which with their feeders give a total amount of internal navigation of about 1300 miles. In the upper part of its course, above the junction of the Allier, the valley of the Loire is narrow. At its source the Loire is about 4600 feet above the sea-level; below Nevers, at its junction with the Allier, 550 feet; at Orléans, 294 feet; a little below Tours, 160 feet; at the junction of the Mayenne, 115 feet; and at Nantes, 83 feet above the sea-level.

The whole course of the Loire is 546 miles, of which 505 are navigable; but of these, 44 miles, from La-Noirie to Roanne, are navigable down the stream only. For two-thirds of the distance above Roanne, the Loire is available for floating timber.

This river, with its larger affluents, constitutes the great outlet for the produce of central and western France. The banks are celebrated for their beauty, particularly in the neighbourhood of Tours. From the melting of the snows in the Cévennes, in which it has its source, the Loire is subject to great inundations, to prevent which it has been embanked in the level tracts below Orléans. [Indre-et-Loire.] The sand and soil which its waters bring down form islands or shifting banks in its course, which materially impede the navigation, especially above Orléans: to avoid this inconvenience, a canal has been formed along the left bank of the river, from the Canal du Centre, at the junction of the Arroux, to the Canal de Briare, at Briare near Gien. The tide flows about 40 miles up the river, to a short distance above Nantes. [Loire-Inferieure; Nantes.] The Loire is connected with the Saône by the Canal du Centre, with the Seine by the Canals de Briare, d'Orléans, and du Loing, and with Brest harbour by the canal from Nantes to Brest.

LOIRE, a department in France, comprising the greater part of the district of Forez, is bounded N. by the department of Saône-et-Loire, E. by those of Rhône and Isère, S. by those of Ardèche and Haute-Loire, and W. by those of Puy-de-Dôme and Allier. It extends from 45° 13′ to 46° 17′ N. lat., and from 3° 41′ to 4° 45′ E. long.; its greatest length is 77 miles, its average width is about 29 miles. The area is 1832½ square miles, and the population is 453,786; which gives 247.6 to the square mile, being 73.8 above the average per square mile for the whole of France.

The department belongs almost entirely to the basin of the Loire, which is separated from that of the Rhône by the Cévennes Mountains on the east, and from that of the Allier by a secondary chain of the Cévennes Mountains on the west. The interior of the department may be described as two large inclined planes descending from these two mountain ranges, and intersecting in the water-line of the Loire; but as the mountains, in their course northwards, trend off respectively in directions nearly N.N.E. and N.N.W., the northern portion of the department has more the appearance of a single wide plain, which includes part of the former provinces of Beaujolais and Bourbonnais, and is called the plain of Roanne. The rest of the department is called the plain of Forez; and between it and the plain of Roanne the division is marked by a chain of hills running E. and W., and uniting the two mountain-ranges before named, except at the point where it is broken through by the Loire. A small portion of the south-east of the department extends eastwards of the Cévennes into the basin of the Rhône, which river runs along the boundary for about 6 miles. In the western part of the plain of Forez, several isolated volcanic swells, consisting of black basalt, lie in a general direction of N. and S., and have their summits crowned with the ruins of ancient castles or monasteries.

The principal rivers are the Loire and the Rhône, by means of which the various industrial products of the department are conveyed to the Atlantic, or to the Mediterranean. The Loire is navigable, in its whole length, in this department to which it gives name; but, owing to the rapidity of the current, it is only the down navigation that is available as far as Roanne, where the general navigation of the river commences. Its principal feeders in this department are the Ondène, the Furens, the Coise, the Lignon, and the Sornin. The Gier is the only feeder the Rhône receives from this department. The lateral canal of the Loire from Roanne to Digoin runs through the north of the department; another canal runs from Rive-de-Gier to the Rhône. The department contains many ponds and tarns, about 450 of which are in the plain of Forez. A railroad runs along the right bank of the Loire, from Roanne to St.-Étienne, near which it crosses the Cévennes, and continues up the valley of the Rhône to Lyon; its length in this department is 79 miles. The department is also traversed by 6 royal, 11 departmental, and 21 parish roads.

The mountains of the department abound with excellent pasture and medicinal plants; their lower slopes are cultivated or covered with vineyards and chestnut woods. In the plains the common breadstuffs are grown, but in quantity insufficient for the consumption; hemp, excellent fruits, oleaginous seeds, and dyestuffs are also raised. About 6,000,000 gallons of good ordinary red and white wines are produced annually.

Horses and black cattle are small; the sheep are noted for their sweet flesh; poultry and game are abundant. In the valley of the Rhône, mulberry-trees are extensively grown for the production of silk. There are also extensive forests of pine, fir, beech, and oak; on Mont-Pilat, near St.-Étienne, an immense number of deals are made, saw-mills being established on every available stream of water. But much of the finest pine timber is made into charcoal, in consequence of the great difficulty of transport from the mountain-heights on which it grows; the finest trees vary from 98 to 115 feet in height. Great quantities of chestnuts are grown; these enter largely into the food of the people; the finest are sent to Paris, where they are sold (like those of Ardèche) under the name of *marrons de Lyon.*

The department contains one of the richest coal-beds in France, which, besides feeding the numerous factories and furnaces of St.-Étienne, and other places in the department, furnishes large quantities for exportation to Lyon and the towns on the Rhône. The quantity of coal annually furnished by the mines of Loire amount to one-third of all the coal raised in France. Lead and iron mines are also worked; building stone, granite, potters' clay, &c., are found; mineral springs are numerous.

The manufactures of the department are of the greatest variety and importance, and give rise to a very extensive commerce. The chief products are fire-arms, ironmongery, and machinery of all kinds, silks, ribands, crape, velvet, plush, laces, linen, cotton, glass, bricks, steel, iron, scythes, hardware, canvas, mill-castings, files and tools of all descriptions, cotton and linen yarn, lace, cutlery, earthenware, tiles, lime, &c. &c. Great numbers of coal barges and canal boats are built at Roanne and St.-Rambert. The great centre of manufacturing industry is St.-Étienne. The number of wind and water mills amounts to 936; of iron and steel works to 94; of factories of different kinds to 714. About 300 fairs are held yearly for the sale of cattle and agricultural produce.

The department contains 1,172,854 acres, distributed among 93,367 proprietors, and into 885,567 parcels. Of this area 613,100 acres are arable land; 211,609 pasture land; 34,342 acres are laid out in vineyards; 156,824 are covered with woods; 31,821 with rivers, ponds, canals, &c.; 92,329 acres consist of barren heath and moorland; and 35,322 are occupied with roads, streets, buildings, &c.

The department is divided into three arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Montbrison .	9	139	131,296
Roanne. . .	10	112	134,109
St.-Étienne .	9	76	188,301
Total. . .	28	327	453,786

Of the arrondissement of Montbrison, the chief town, *Montbrison*, stands on the Vizézy, a small feeder of the Loire, in 45° 36′ N. lat., 4° 3′ 45′ E. long., at a distance of 45 miles W. from Lyon, and has 7054 inhabitants. It is built round a basaltic hill (from the summit of which there is a fine view over the plain of Forez), and at the extremity of a branch railroad that joins the St.-Étienne-Roanne Line at Montrond. The town, which is ill built, with narrow winding streets and low houses, has a tribunal of first instance, communal and ecclesiastical colleges, a primary normal school, and a public library of 15,000 volumes. The principal building is the cathedral of Notre-Dame. The old ramparts and ditches are now replaced by handsome promenades. Montbrison is the capital of the department of Loire, which distinction it owes solely to its central situation; or with respect to population, for commercial and industrial activity, it is greatly surpassed by St.-Étienne and Roanne. *St.-Bonnet-le-Château*, on a high hill in the south of the department, and on the Roman road made here by Agrippa, has 2066 inhabitants. *Chazelles-sur-Lyon*, a small but well-built walled town E. of Montbrison, has a population of 3011. *Feurs*, the ancient *Forum Segusianorum*, and the midway station on the railroad from St.-Étienne to Roanne, from each of which towns it is 25 miles distant, stands in a fertile, well-watered plain near the right bank of the Loire, and has 2646 inhabitants. The Roman antiquities found in the town are numerous; the high stone dykes which confine the Loire in the neighbourhood are said to be of Roman construction. *St.-Galmier*, 12 miles E. of Montbrison, on the St.-Étienne-Roanne Railroad, stands on a high hill near the right bank of the Coise, and has a population of 2758. It is said to occupy the site of the ancient *Aquæ-Segestæ;* and is still famous for its cold mineral spring. *St.-Rambert*, 11 miles S.E. from Montbrison, is prettily situated on the left bank of the Loire, and has 3078 inhabitants. The church of St.-Rambert is remarkable for its great antiquity. Nearly 3000 barges are built here annually, and sent down the Loire laden with coal to Roanne. In the neighbourhood are several iron forges and smelting furnaces. *Sury-le-Comtal*, 7 miles S. from St.-Rambert, for a long time the residence of the counts of Forez, whose castle is still in good preservation, has 2454 inhabitants.

In the arrondissement of Roanne, the chief town, *Roanne*, is situated on the left bank of the Loire, which is here navigable, at a distance of 50 miles by railroad from St.-Étienne, and has a tribunal of first instance, a consultative chamber of manufactures, a college, and 11,330 inhabitants. The town is well built, with straight wide streets, formed by handsome houses; the new bridge over the Loire, the public library, and the college buildings are the most remarkable structures. The manufactures, which are important, consist of muslin, calico, broad-cloth, handkerchiefs, glue, oil, porcelain, linen thread, cotton yarn, and leather; there are several dye-houses, and numerous boat-building yards. By means of the lateral canal of the Loire, which enters that river at Digoin, and by the numerous canals and rivers that join the Loire, Roanne has water communication with all the principal towns in France.

The trade in corn, wine, flour, spun cotton, calico, planks, charcoal, the manufactures of Lyon, and of the southern and eastern departments of France, is very considerable. *Belmont*, 3 miles N.E. from Roanne, has 3440 inhabitants. *Charlieu*, 12 miles N. by E. of Roanne, on the Sornin, a feeder of the Loire, is famous for the remains of a Benedictine abbey, and has 3689 inhabitants, who manufacture linen, cotton, silk and cotton yarn, and shoe and glove leather. The hospital of Charlieu, one of the oldest in France, was founded by St. Louis. *Perreux*, on the Rodon, 4 miles from Roanne, has 2517 inhabitants. *St.-Symphorien-de-Lay*, 10 miles S.E. from Roanne, has cotton factories, coal mines, and 3989 inhabitants.

Of the arrondissement of St.-Étienne, the chief town is *St.-Etienne*. [ÉTIENNE, ST.] *Bourg-Argental*, on the Déome, in a fertile valley abounding with mulberry plantations, from which silk of the best quality is produced, stands 18 miles S. from St.-Étienne, and has 2529 inhabitants. *Le-Chambon*, 3 miles from St.-Étienne, is situated on the Dondaine-Vachery, and has 4028 inhabitants, who manufacture ribands, iron and steel ware, table cutlery, pocket-knives, &c. *St.-Chamond*, beautifully situated at the confluence of the Gier and the Janon, 7½ miles N.E. from St.-Étienne, and near the Lyon-St.-Étienne railway, is a busy manufacturing town, containing a consultative chamber of manufactures, a conseil des prud'hommes, and 8204 inhabitants. The town is well built, and presents a great number of elegant houses inclosed in gardens. The church of St.-Chamond, the public baths, and promenades are the most remarkable objects in the town. There are extensive coal mines, iron forges, and smelting furnaces in the environs. The town contains a great number of silk mills, and has important manufactures of ribands, stay-laces, nails for the navy, hardware, &c. *St.-Genest-Malifaux*, 9 miles S. from St.-Étienne, near the right bank of the Semène, has a population of 3691. *St.-Héand*, 6 miles N from St.-Étienne, contains silk mills, and 3483 inhabitants. *Pélussin*, situated at the foot of Mont Pilat, at a short distance from the Rhône, and in a fertile vine district, has 3511 inhabitants. The preparation of raw silk for manufactures, and the working of the porphyry quarries of the neighbourhood, afford employment to a considerable part of the population. *Rive-de-Gier*, 13 miles N.E. from St.-Étienne, on the Lyon-St.-Étienne Railroad, previous to 1815 had under 4000 inhabitants; it now has a population of 11,543. It is built on the Gier, here crossed by several bridges, and rendered navigable by the Canal-de-Givors, which runs from this town to Givors on the Rhône. The town owes its prosperity to the coal mines, exceeding 40 in number, which are worked in the neighbourhood. The basin of the canal is lined with quays, backed by vast coal stores. The reservoir of the Canal-de-Givors, a little S. of the town, is formed by massive mason-work, and is a fine work of its kind. Besides its great trade in coal, with which Lyon and several other towns are supplied, Rive-de-Gier has above 40 glass works, steam engine factories, iron foundries and forges, steel works, silk mills, riband factories, &c.

The department forms with that of Rhône the see of the archbishop of Lyon and Vienne; it is comprised in the jurisdiction of the Cour Royale and University Academy of Lyon, and is included in the 7th Military Division, of which Lyon is head-quarters. Under the monarchy it returned 5 members to the Chamber of Deputies; it now has 11 representatives in the National Assembly.

(*Dictionnaire de la France; Annuaire pour l'An* 1849; *Statistique de la France.*)

LOIRE, HAUTE, a department in France, comprising the district of Vélay and parts of Gévaudan, Forez, and Auvergne, takes its name from its situation in the upper part of the basin of the Loire, and is bounded N. by the departments of Puy-de-Dôme and Loire, E. by Ardèche, S. by Lozère, and W. by Cantal. Its greatest length from E. to W. is 69 miles, from N. to S. 46 miles; it extends from 44° 44′ to 45° 25′ N. lat., and from 3° 4′ to 4° 26′ E. long. The area is 1925 square miles, and the population in 1846 was 307,161; which gives 159.564 to the square mile, being 14.186 below the average per square mile for all France. The department is mountainous. The Cantal Mountains, and the Margeride chain, which unites them to the Cévennes, cover with their off-shoots so much of the south-west and south of the department as lies on the left bank of the Allier: the south-eastern and eastern districts are occupied with the mass of the Cévennes, from which a secondary chain, running through the interior nearly N. and S., forms the watershed between the Allier and the Loire, and is joined, near Chaise-Dieu, by another range that runs N.W. from Mont Mezenc, the culminating point of the Cévennes [CE'VENNES; ARDE'CHE]. The country, thus surrounded and traversed by mountains, is furrowed by numerous rivers, brooks, and torrents, which flow with rapid descent, either between steep banks that expose to view the volcanic formation of the rocks, or through picturesque and fertile valleys whereof the soil consists of decomposed lava and other volcanic deposits. On the mountains, which present numerous conical peaks and craters, and have their summits covered with snow during five or six months in the year, there are large forests and extensive pastures, where great numbers of cattle and mules, the chief wealth of the country, are reared. The lower slopes are covered with chestnut woods and vineyards. In the north-west and north-east of the department there are some extensive plains of considerable fertility, all covered with a soil of decomposed volcanic matter.

The principal rivers are the ALLIER, which drains the west of the department; and the LOIRE, which, swelled by the Gazeille, the Lignon, and the Somme, from the right bank, and by the Borne, the Arzon, and the Ance, from the left, drains the central and eastern districts. The department is traversed by 6 royal and 12 departmental roads.

The agricultural produce of the department suffices the consumption. The usual crops are wheat, rye, barley, oats, meslin, beans, &c.;

fruits are abundant. Of wine only 1,264,000 gallons are produced, and this is of inferior quality. Mules are reared in great numbers; Horned cattle and pigs are fatted in considerable numbers. Among the wild animals are boars, wolves, foxes, wild cats, badgers, &c.

The geological structure and mineral wealth of the department are of great variety, though the latter is not turned to much advantage. The mountain-range which runs north-west from Mount Mezenc consists of trachytic rocks, and is reckoned among the most ancient of the volcanic structures of central France. The district of Vélay, which lies S. and S.W. of this range, and comprises nearly all the south of the department, is occupied with basaltic rocks and lava beds, the great antiquity of which is proved by their being covered with a soil formed by the decomposition of their surface. Along the banks of the rivers in this district, the basaltic columns laid bare to view assume a variety of beautiful forms; and the charred fragments of ancient eruptions, which were long subsequently rolled and worn in watercourses that have disappeared for ever, are seen in other places deposited in beds of clay and marl, piled up alternately one upon the other. Among the primitive rocks are found granite, gneiss, quartz, mica schist, &c. Coal, lead, and antimony mines are worked; iron and copper ores are found at various points. Calcedony, diamond-spar, sapphires, amethysts, tourmalines, &c., are found, and also marble, millstone grit, plaster of Paris, &c., &c. Mineral springs are numerous; they are all saline or acidulous.

The manufactures consist of common articles of necessity and use, and are unimportant, with the exception of silk and thread lace and ribands. The people are in general poor, and many of them emigrate during the winter months as sawyers, hawkers, porters, sweeps, &c. About 300 fairs are held.

In a country the highest point of which, Mont Mezenc, is 5820 feet above the sea-level, whilst its lowest point, namely where the Allier crosses the northern border, is only 1279 feet above the same level, there is room for very great variety of climate and season. Seed-time and harvest differ in different cantons according to the elevation, the maximum variation amounting to as much as two months; and such is the difference of climate, that, while in some districts the vine flourishes, in others rye will hardly ripen. The south-west wind blows at times for weeks continually, and with great violence; the west and north-west winds bring rain.

The department contains 1,232,013 acres, distributed among 93,181 proprietors, and into 1,290,419 parcels. Of this area 560,258 acres are arable; 196,288 acres are grass land; 14,569 acres are occupied with vines; 177,896 with woods and forests; 222,994 acres consist of barren heaths and moors; 9371 of orchards, gardens, and plantations; and 12,680 are covered with rivers, tarns, and brooks.

The department is divided into three arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Le-Puy . . .	14	117	135,753
Yssengeaux .	6	39	87,079
Brioude. . .	8	118	84,329
Total . .	28	274	307,161

In the arrondissement of Le-Puy, the chief town, *Le-Puy*, which is now the capital of the whole department, as it formerly was of the district of Vélay, is situated at the foot and around the southern slope of a steep hill, at the junction of three pretty valleys, watered respectively by the Loire, the Borne, and the Dolaison, in 45° 2′ 46″ N. lat., and 3° 52′ 55″ E. long., 66 miles S.W. from Lyon, and has 14,674 inhabitants. Except the broad street at the foot of the hill, through which the roads from Clermont and Lyon run, the rest of the town is built in form of an amphitheatre round the steep sides of Mont Anis, which is surmounted by a lofty basaltic rock called Corneille. From a distance Le-Puy presents a most picturesque appearance; but the interior view disappoints the expectations thus raised. The streets are irregular, narrow, and in the upper part of the town inaccessible to carriages; they are paved with volcanic breccia, which in all weathers is slippery and dangerous to walk upon. The most important structures are—the cathedral, situated in the highest part of the town; the church of St.-Laurent, situated at the foot of the hill, and containing the monument and part of the remains of Du-Guesclin; the prefect's residence in the spacious square of Du-Breuil; the college church; the museum, near the cathedral, in which are numerous paintings, Roman antiquities, and one of the best collections of geological and mineralogical specimens in France; the theatre, an ancient structure, supposed to have been a heathen temple; the ecclesiastical college; and the Parnessac gate, a fine specimen of military architecture over one of the promenades of the town. Le-Puy is the seat of a bishop, and contains tribunals of first instance and of commerce, a consultative chamber of manufactures, a college, a public library, and various literary and scientific societies. In the suburb de l'Aiguille is an isolated basaltic rock of pyramidal form, and 285 feet high, which is ascended by a staircase of 218 steps cut in the rock, and is surmounted by the highly ornamented chapel of St.-Michel, erected in the 10th century. Between this rock and that of Corneille stands a heptagonal building, said to have been a chapel dedicated to St. Clair, and now used as a corn-store. The chief industrial products of Le-Puy are lace, coarse woollens, wine-skins, nails, and leather; the commerce is in these articles, and in corn, iron, pottery, cattle, &c. *Craponne*, 17 miles N. from Le-Puy, has a population of 3763. *Le-Monastier*, 11 miles S.E. from Le-Puy, has a population of 3461. *St.-Paulien*, built on the ruins of an ancient city, said to be Ruessium or Revessia Vellavorum, has a population of 3016; several Roman coins, vases, monuments with inscriptions,

have been found, and are preserved here. *Saugues*, a town of 3805 inhabitants, stands in a rich corn and pasture country, 16 miles W.S.W. from Le-Puy, and has some woollen manufactures. Just outside the walls is a monument of rudely cut stone without inscription, which is traditionally called the Tomb of the English General.

In the arrondissement of Yssengeaux, the chief town, *Yssengeaux* or *Issengeaux*, an ill-built gloomy place, is situated on a high hill 14 miles N.E. of Le-Puy, and has a tribunal of first instance, a college, and 9408 inhabitants, who manufacture silk, lace, and ribands, and trade in timber, cattle, sheep, &c. *Bas-en-Basset*, on the left bank of the Loire, 12 miles from Yssengeaux, has 5783 inhabitants, who manufacture lace and pottery. The town, which is commanded by the old castle of Rochebaron, has a mineral spring. *St.-Didier*, 14 miles N.E. from Yssengeaux, has silk factories and 3972 inhabitants, who manufacture ribands and articles in papier-maché. *Manistrol*, 12 miles N.E. from Yssengeaux, near the right bank of the Loire, is an ugly ill-built town, with an important corn-market, and 3975 inhabitants, who manufacture lace, ribands, hardware, satin, silk handkerchiefs, leather, and papier-maché articles. *Tence*, a manufacturing town of 5468 inhabitants, is prettily situated on the right bank of the Lignon, 9 miles E. by S. from Yssengeaux.

In the arrondissement of Brioude, the chief town, *Brioude*, is situated 29 miles N.W. from Le-Puy, near the left bank of the Allier, and has tribunals of first instance and of commerce, a college, and 4940 inhabitants. It is an ill-built town. The most remarkable structures are the church of St.-Julien and the college buildings. *La-Chaise-Dieu*, 15 miles E. from Brioude, a town of 2000 inhabitants, takes its name from the famous monastery of Chaise-Dieu (Casa Dei), which, with the exception of the church, was destroyed during the revolution of 1793. The abbey church, erected about the middle of the 14th century, at the expense of Pope Clement VI., a native of Chaise-Dieu, is considered one of the finest abbey churches remaining in France; it contains tombs of Clement VI. and Gregory XI., some very ancient tapestries, and is greatly admired for the carved wood-work of the 156 stalls in the choir. The walls of the choir are ornamented with ancient paintings in fresco, representing the allegory of the Dance of Death. *Langeac*, built in a pretty situation, on the left bank of the Allier, has 3231 inhabitants. There are coal-mines and stone-quarries near this town.

The department forms the see of the Bishop of Le-Puy, is included in the jurisdiction of the Cour Royale of Riom, and of the University Academy of Clermont, and belongs to the 19th Military Division, of which Clermont is head-quarters. Under the monarchy it returned 3 members to the Chamber of Deputies; it now has 8 representatives in the National Assembly.

(*Dictionnaire de la France; Decree of the Provisional Government of the French Republic; Annuaire pour l'An* 1849.)

LOIRE, INFE'RIEURE, a department in France formed out of a part of Bretagne, and lying along the lower course and the mouth of the Loire, is bounded N. by the departments of Morbihan and Ille-et-Vilaine, E. by those of Mayenne and Maine-et-Loire, S. by that of Vendée, and W. by the Bay of Biscay. It extends from 46° 52′ to 47° 52′ N. lat., and from 0° 55′ to 2° 32′ W. long.; its greatest length from E. to W. is 74 miles, from N. to S. 69. The area is 2632 square miles, and the population in 1846 was 517,265, which gives 196.53 to the square mile, being 22.78 above the average per square mile for all France.

The coast line is about 55 miles in length. It presents an irregular outline, broken in the north by the bays of Pennebe and Pembron, which are separated by the promontory of Piriac; in the centre by the embouchure of the Loire, to the north of which are some small islets; and in the south by the large Bay of Bourgneuf. There are considerable salt marshes along this coast. The surface of the department is level, with the exception of a line of low hills, which crosses it in the north, forming the watershed between the Loire and the Vilaine. The principal river is the Loire, which enters the department below Ingrande in Maine-et-Loire, and divides it into two unequal parts. It is 5 miles wide at its mouth, and is navigable for large vessels up to Nantes, to a few miles above which the tide ascends. The principal feeders of the Loire in this department are, from the left, the Sèvre-Nantaise and the Achenau, which last is the outlet of the lake of Grand-Lieu; from the right, the Erdre, which enters the Loire at Nantes. The Vilaine touches the department on the north-west, receiving the Don and the Isac. The other most considerable rivers are the Maine and the Moine, feeders of the Sèvre-Nantaise; the Ognon and Boulogne, which flow from Vendée into the Lake of Grand-Lieu; the Brivé, which enters the Loire above St.-Nazaire; and the Tenu, a feeder of the Achenau. The department is crossed by the canal from Nantes to Brest; also by 6 royal, 17 departmental, and a great number of parish roads. The Orléans-Tours Railway is in course of continuation to Nantes, and is now (May 1849) open to Saumur, 38 miles W. from Tours. The climate is healthy, although somewhat damp.; the heat in summer is often very great.

Grand-Lieu, the largest lake in France, and the reservoir for the waters of the Boulogne, the Ognon, and some smaller streams, is situated near the left bank of the Loire, with which it has communication by its navigable outlet the Achenau. It has an area of 29 square miles, and abounds in fish; its shores are marshy. North of the Loire, there are many small lakes, and extensive marshes and bogs.

The quantity of cereal grain produced suffices the consumption. The chief crops of this kind are wheat, rye, buckwheat, and meslin. Barley is grown in small quantity. The meadows and pastures along the Loire, in the islands formed by the deposits of the river, and in the neighbourhood of the marshes, are excellent. Cattle of good breed are very numerous; horses, of which also

great numbers are reared, are small. The apple tree is extensively cultivated north of the Loire for making cider; and in the same district there are forests of vast extent. The *Bocage* district, which stretches south-east of the Lake of Grand-Lieu, is well wooded, as the name implies, every field being inclosed with hedgerows and lines of timber trees. The vineyards of the department yield 32,200,000 gallons of wine annually, rather less than a third of which is used for the home consumption; of the surplus, part goes to the supply of Paris, some is distilled into brandy, and the rest is sent to Orléans to be converted into vinegar. The wines are considered of middling quality; the sweet wines are prized for their agreeable flavour, and for their keeping qualities. Fishing affords occupation to a great number of the inhabitants.

Granite, quartz, mica, kaolin, and feldspar are found in the arrondissement of Nantes; in that of Châteaubriant extensive slate quarries are worked, and iron ore is abundant, supplying 20 forges, blast-furnaces, and foundries. In the arrondissements of Châteaubriant and Ancenis there are important mines of coal of excellent quality; magnetic iron is found in isolated particles on the surface of the ground on the right shore of the embouchure of the Loire. There are mineral springs and sea-bathing establishments at Plaine and Pornic.

The principal manufactures are linen, calico, printed cotton, serge, and coarse woollen stuffs; ship-building is carried on at Nantes, Paimbœuf, and Pellerin; and at Indret, one of the small islands in the Loire, there are establishments for the manufacture of steam-machinery, and also slips for building steam-frigates. Other articles of industrial produce are paper, leather, porcelain, glass, ship cordage, chain cables, cotton yarn, refined sugar, &c. [NANTES.] There are in the department 1698 wind and water mills, 52 iron forges and blast furnaces, and 76 factories of various kinds.

The department has an important commerce with foreign countries, coastwise, and with the interior. The principal articles of trade are wine, brandy, fruits, salt (of which a vast quantity is made along the coast), hardware, oil, provisions, soap, wool, and other French and colonial produce. Ships are fitted out for the whale, herring, and cod fisheries; and the mackerel and pilchard fisheries along the coast are actively plied. About 340 fairs are held annually. At these fairs not cattle only, but broad cloth and small wares of all descriptions are sold.

The department contains 1,684,588 acres, distributed among 132,534 proprietors, and into 2,249,459 parcels. Of this area 794,722 acres are cultivated; 259,490 are grass land; 72,518 are under vine culture; 92,796 are covered with woods and forests; 27,143 with orchards and plantations; 319,647 acres are heaths and moor land; 43,749 are occupied with rivers, lakes, canals, &c.; and 71,285 with roads, streets, &c.

The department is divided into five arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Nantes . . .	17	67	233,768
Ancenis . .	5	28	47,397
Châteaubriant.	7	36	67,538
Paimbœuf . .	5	25	45,190
Savenay . .	11	51	123,372
Total . .	45	207	517,265

In the arrondissement of Nantes the chief town is NANTES, which is also the capital of the whole department. *Chartenai*, situated on a high hill above the right shore of the Loire, has a population of 3935. *Clisson*, beautifully situated on the slopes of two hills at the junction of the Moine and the Sèvre-Nantaise, has a population of 2759, who manufacture woollen cloth, cotton yarn, leather, and paper. On a rock above the town stand the majestic ruins of the ancient castle of Clisson, which for extent, construction, and beauty of site has scarcely an equal among the castellated structures of France, while in historical associations it far outstrips them all. Some repairs have been lately made in order to arrest the progress of decay among these magnificent ruins. *Chapelle-sur-Erdre*, on the slope of a hill near the left bank of the Erdre, has 2420 inhabitants. *Légé* is situated in the south of the department, near the right bank of the Logne, on a hill which commands a fine view of a rich well-cultivated country. The town, which suffered greatly in the civil war between the Vendeans and the Republicans, has 3401 inhabitants. On the Nantes road, at a short distance from Légé, a monument was erected in 1827 to the Vendean general Charette, which was demolished during the short frenzy of 1830. *Loroux-Bottereau*, a few miles E. of Nantes, has 5000 inhabitants; within the town, in a spacious circular place surrounded by trees, a statue of Louis XVI. is erected. *Machecoul*, an ill-built town on the little river Falleron, and formerly the capital of the duchy of Retz, is 20 miles S.W. from Nantes, and has 3745 inhabitants. This town was the scene of great cruelties and of some severe actions during the Vendean war. *St.-Philbert*, 14 miles S.W. from Nantes, is situated on the navigable river Boulogne, near its entrance into the Lake of Grand-Lieu, and has 3285 inhabitants. It stands in a fertile wine and corn country, and is a place of some trade in agricultural produce, timber, &c. *Vallet*, 5 miles N. of Clisson, is situated on a height among rich vineyards, that yield the best wine of the department, and has 5583 inhabitants. *Vertou*, 5 miles S. by E. from Nantes, stands near the right bank of the Sèvre-Nantaise, and has 5635 inhabitants.

Of the arrondissement of Ancenis, the chief town, *Ancenis*, is prettily situated among vine-clad slopes on the right bank of the Loire, 20 miles N.E. from Nantes, and has a tribunal of first instance, a college, and 3802 inhabitants. The old castle of the Dukes of Bethune, from the gardens of which there is a splendid view of the valley and islands of the Loire; the Ursuline convent,

now a cavalry barrack; and the hospital, are deserving of notice. The steam-boats that navigate the Loire make Ancenis one of their stations. *Varades*, 8 miles E. from Ancenis, stands on a high hill near the right bank of the Loire, and has 3483 inhabitants. It was before Varades, that the Vendean army, after their defeat at Chollet by the Republicans, crossed the Loire in 1793.

In the arrondissement of Châteaubriant, the chief town, *Châteaubriant*, stands 37 miles N. by E. from Nantes, and has a tribunal of first instance and 3732 inhabitants, who manufacture common woollen stuffs, cordials, earthenware, tiles, and leather. *Moisdon*, on a hill near the right bank of the Don, has iron mines, iron forges, and 2305 inhabitants. *Nort*, 15 miles N. from Nantes, is situated on the right bank of the Erdre, across which a stone bridge of 6 arches leads to the suburb of St.-Georges. The Erdre here becomes navigable for steamers which ply daily to and from Nantes. Nort is a busy town, with a population of 5561, who trade largely in wood, charcoal, and coal, for the supply of Nantes, in iron, leather, cattle, &c. *Nozay*, 11 miles N. from Nort, on the road from Nantes to Rennes, has 3002 inhabitants. *Rougé*, 5 miles N.W. of Châuteaubriant, gives name to important iron mines, and has 2272 inhabitants.

The arrondissement of Paimbœuf is named from its chief town, *Paimbœuf*, which stands 24 miles W. of Nantes, on the left bank and near the embouchure of the Loire, and has a tribunal of first instance, a naval school, and 4000 inhabitants, who are chiefly engaged in the construction and repairing of ships, in the manufacture of cordage, tiles, and bricks, and in the fisheries and coasting trade. The town consists chiefly of one long street, which is built along the quays which line the river. It has a harbour formed by a well-constructed mole, and capable of admitting the largest ships. Steamers ply several times a day to Nantes. The population of Paimbœuf was nearly 10,000 before the French lost the West Indian Islands. *Bourgneuf-en-Retz*, 15 miles S. from Paimbœuf, is situated on the Bay of Bourgneuf, opposite the isle of Noirmoutier, in a low marshy place, and has 2625 inhabitants, who are engaged in the fishery along the coast and in the manufacture of salt. *St.-Père-en-Retz*, 4 miles S. from Paimbœuf, has 2679 inhabitants.

The arrondissement of Savenay is named from its chief town, *Savenay*, a small place of 2227 inhabitants, situated 22 miles N.W. from Nantes, near the right bank of the Loire. The town, which has a tribunal of first instance, was the scene of a most bloody engagement (Nov. 25, 1793) between the Republican army under Westermann, Kléber, Marceau, and Tilly, and the gallant Vendeans, who were entirely defeated. A monument in honour of the slain has been erected in the cemetery of Savenay. *Batz*, situated among the salt-marshes on the sea-shore, where it has a good fishing harbour, is a well-built town with 3597 inhabitants. It has a handsome church with a tower, terminating in an elegant cupola 180 feet high, which serves as a land-mark for sailors. *Blain*, near the right bank of the Isac, has 5441 inhabitants. The town was formerly defended by a strong feudal castle, erected by Alan, duke of Bretagne, in 1105. This fortress, which, with the exception of its towers, is still in tolerable preservation, subsequently belonged to the family of Clisson, from whom, by the marriage of Beatrix, daughter of the Constable Olivier de Clisson, it passed to the Dukes of Rohan. *Coueron*, prettily situated on the right bank of the Loire, which here forms a commodious harbour for the repairing of vessels, has glass-works and 4214 inhabitants. *Croisic*, situated on the extremity of a small tongue of land that juts out into the Bay of Biscay, is an ill-built place with 2539 inhabitants, who are chiefly engaged in the fisheries, in the manufacture of salt and soda, and in the coasting trade. On a dangerous ledge of rocks called *Le-Four*, off Croisic, a light-house is erected. *St.-Etienne-de-Mont-Luc*, 9 miles S.E. from Savenay, has a population of 4540. *Guéméné*, situated on a hill near the right bank of the Don (which here begins to be navigable), at a distance of 22 miles N.N.E. from Savenay, and has 4013 inhabitants. *Guérande*, an ancient town, situated about 3 miles from the sea and 25 miles W. from Savenay, has an ecclesiastical college, two hospitals, and 8503 inhabitants, who manufacture great quantities of salt, linen, serge, cotton, and woollen yarn, &c. The town, built on the slope of a hill, is commanded by an old castle flanked with towers; it is surrounded by walls built of granite, and pierced by four gates situated at the cardinal points. The ditches which formerly surrounded this ancient fortress are now filled up and converted into shady walks. *Herbignac*, 18 miles N.W. from Savenay, has extensive potteries and 3176 inhabitants. *St.-Nazaire*, a town of 3771 inhabitants, composed chiefly of sailors, pilots, fishermen, and custom-house officers, is situated on the northern shore of the embouchure of the Loire. It has a light-house at the head of the mole which forms the harbour; its chief trade is in fish, corn, and salt. *Pont-Château*, on the left bank of the Brivé, which is navigable by means of the tide from this town to its entrance into the Loire a little above St.-Nazaire, has a corn-market, tan-yards, and 3516 inhabitants.

The department forms the see of the Bishop of Nantes, is included in the jurisdiction of the Cour Royale and University Academy of Rennes, and belongs to the 12th Military Division, of which Nantes is head-quarters. It used to return 7 members to the Chamber of Deputies; it now has 13 representatives in the National Assembly.

(*Dictionnaire de la France; Annuaire pour l'An* 1849; *Statistique de la France.*)

LOIRET, a department of France, formed out of the eastern part of the province of Orléanais, and a small part of Berry, lies between 47° 29′ and 48° 20′ N. lat., 1° 32′ and 3° 5′ E. long., and is bounded N. by Seine-et-Oise and Seine-et-Marne, E. by the department of Yonne, S. by those of Nièvre, Loir-et-Cher, and Cher, and W. by Eure-et-Loire. Its greatest length from E. to W. is 72 miles, and its average breadth from N. to S. is 42 miles. The area is 2578 square miles, and the population in 1846 was 331,633; which gives 128.639 to the square mile, being 45.11

under the average per square mile for the whole of France.

The department is divided into two unequal parts by the Loire. The district situated S. of this river is part of the old district of Sologne [CHER], and presents a barren sandy soil, covered with heath, but here and there swelling into hills, which are planted with vines, yielding red and white wines of moderately good quality. The district N. of the Loire is composed of fertile and well-cultivated plains, separated by wooded hills, and diversified by extensive forests, rich meadows, and pasture lands. A chain of hills that forms part of the watershed between the Seine and the Loire traverses the department from S.E. to N.W., at no great distance from the right bank of the LOIRE, which river crosses the department in the same direction as far as Orléans, where it sweeps round to the south-west.

The department takes its name from the *Loiret*, a little river that rises all at once in full flood from a spring in the park of Château-de-la-Source, a few miles S.S.E. from Orléans, and flowing westwards enters the Loire on the left bank after a course of 7 miles. The waters of the Loiret never freeze, owing to the high temperature which they have on issuing from the earth, and to the shortness of their course. The *Duis*, a sluggish muddy stream, is the principal feeder of the Loiret; before its junction with the latter it enters a whirlpool by which part of its waters are generally absorbed, the remainder being conducted to the Loiret by a short canal. But at certain seasons of the year, when the waters of the Loiret are highest, a portion of them ascends the canal and enters with the Duis into the whirlpool, which is said to have an underground communication with the Loire. When the waters of the Loire however rise above the usual level, the whirlpool then, instead of absorbing the waters of either river, overflows and adds considerably to their quantity. The Loiret is navigable almost from its source; it drives the machinery of several mills and factories. The *Loing*, which receives the Ouanne and several other feeders, flows N. through this department from that of Yonne in its way to join the Seine. The north-western districts are drained by the Essonne, which flows N. and enters the Seine in the department of Seine-et-Oise. The department possesses great advantages from internal navigation by the Loire, and by the Canal d'Orléans and the Canal de Briare, which unite near Montargis, whence the Canal du Loing runs northward into the department of Seine-et-Marne, and, passing Nemours, enters the Seine near Moret. The department is also traversed by the Paris-Orléans, the Orléans-Nantes, and the Orléans-Bourges railways; and by 9 royal, 14 departmental, and a great number of parish roads.

The climate is mild and extremely healthy; the prevailing winds are the west and south-west.

The district north of the Loire is very productive of rye and other bread-stuffs; but, owing to the infertility of the Sologne district, the produce is little more than enough for the consumption. Yet the department has a most important trade in corn, which however is supplied from the great wheat districts of Beauce, Poitou, Anjou, and Lower Auvergne, and finds easy distribution from the great granaries of Orléans, by the means of transit before mentioned, to different parts of France. The quantity of oats grown is enormous, the annual exports amounting to 1,375,000 quarters. Saffron is extensively and profitably cultivated. Asparagus and other pot-herbs are raised in large quantities. About 22,000,000 gallons of wine are made annually, of which about one-fourth goes to the home consumption; most of the remainder is exported under the name of Vins d'Orléans, generally of ordinary quality; some is retained for making vinegar. Apple, pear, and all fruit-trees common to the north and centre of France are successfully cultivated, and a great quantity of preserves are made. The forests contain chiefly oak, beech, birch, elm, and chestnut. Cattle are of good breed, and also sheep, except in the Sologne, where they are small but well fleeced. Bees are carefully tended; game, poultry, and fish are abundant.

Building and lime stone, marl, and potter's clay are the only minerals found.

The manufactures, except those of Orléans, are unimportant; but the commerce of the department is very extensive. The chief articles of trade are corn, flour, wine, brandy, vinegar, groceries, drugs, fruits and fruit-trees, peas and beans, chestnuts, cider, fish, honey, saffron, salt, wool, firewood, oak-staves, charcoal, cattle, &c. About 220 fairs are held in the year.

The department contains 1,649,933 acres, distributed among 115,370 proprietors, and into 1,727,118 parcels. Of this area 975,088 acres are under tillage; 60,454 are grass-land; 98,554 acres are under vineyards; 280,966 are covered with woods and forests; 15,855 are occupied as orchards and plantations of different kinds; 27,640 are covered with rivers, canals, &c.; 140,509 acres consist of barren heath and moor land; and 50,626 acres are occupied as roads, streets, and buildings.

The department is divided into 4 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Orléans . . .	14	111	150,737
Pithiviers . .	5	103	60,043
Gien . . .	5	49	46,515
Montargis . .	7	95	74,338
Total . .	31	358	331,633

Of the arrondissement of Orléans, and of the whole department, the capital is ORLE'ANS. The other towns are—BEAUGENCY: *Châteauneuf-sur-Loire*, which stands on the right bank of the Loire, E. of Orléans, and has woollen cloth and beet-root sugar factories, and 2994 inhabitants: *Cléry*, which is prettily situated near the left bank of the Loire, 9 miles S.W. from Orléans, and has 2578 inhabitants; this town is famous for its beautiful church of Notre-Dame, in the nave of which is a marble monument to Louis XI., who was buried

here: *Jargeau*, which is 11 miles E. from Orléans, on the left bank of the Loire, here crossed by a fine bridge, and has a population of 2247: *Meuny*, which is a well-built town, situated on the right bank of the Loire, 12 miles by railroad W. by S. from Orléans, and has 4515 inhabitants, who manufacture leather, room-paper, and felt hats, and trade largely in flour: and *Patay*, a small town of 1200 inhabitants, 15 miles N.W. from Orléans, near which Jeanne d'Arc defeated the English in 1429, and took Talbot prisoner.

The arrondissement of Pithiviers is named from its chief town, *Pithiviers*, which is situated on the slope and at the foot of a hill above the Œuf (a feeder of the Seine, which lower down takes the name of Essonne), 25 miles N.E. from Orléans, and has a tribunal of first instance and 3772 inhabitants. The town, which is pretty well built, is famous for its almond-cakes and lark-pies. *Beaune-la-Rollande*, 8 miles S. from Pithiviers, near the Essonne, has a population of 2122.

The arrondissement of Gien takes its name from *Gien*, a well-built town, situated on the right bank of the Loire, which is here crossed by a handsome stone bridge of 12 arches, at a distance of 36 miles E.S.E. from Orléans. From the left bank of the river the view, comprising the bridge and the town, built along the slope of a hill, which is surmounted by the church of St.-Louis and a fine old castle in good preservation, is very pretty. Gien has a tribunal of first instance and 5349 inhabitants, who manufacture porcelain and leather, and trade in salt, corn, wine, saffron, and wool. *Briare*, 6 miles E. by S. from Gien, stands on the right bank of the Loire, at the point where the Briare Canal enters that river. It has a population of 3229, and a good trade in wine, wood, and charcoal. *Châtillon*, further up the Loire and on its left bank, has 2785 inhabitants. *Sully*, 13 miles W. from Gien, on the left bank of the Loire, has a population of 2153, and is remarkable for the castle of the lords of La Tremoille, which was restored by Henri IV.'s minister, Sully, who resided here after the death of his master.

In the arrondissement of Montargis, the chief town, *Montargis*, situated near a forest of the same name, in a plain, 40 miles E. by N. from Orléans, and at the junction of the canals of Briare, Orléans, and the Loing, which complete the navigation between the Loire and the Seine, has a college, tribunals of first instance and of commerce, and 7301 inhabitants. The town, which is pretty well built, has cloth factories, tanyards, paper-mills, and a considerable trade in corn, saffron, hides, wool, cattle, &c. The most remarkable objects at Montargis are the church of La-Madeleine, the old walls of the town, and the few remains of the extensive castle of Montargis, which was erected by Charles V. on a hill that commands the town. *Chateau-Rénard*, situated 11 miles E. from Montargis, near the right bank of the Ouanne, has 2378 inhabitants. *Châtillon-sur-Loing*, 14 miles S.S.E. from Montargis, on the canal and river Loing, has a population of 2067. *Courtenay*, the cradle of the ancient house of Courtenay, is situated 15 miles E. by N. from Montargis, on the little river Clare, a feeder of the Loing, and has 2567 inhabitants. *Lorris*, formerly a favourite residence of the kings of France, and famous for its ancient charter of privileges, is situated 12 miles S.W. from Montargis, and has a population of 1847.

The department forms the see of the Bishop of Orléans, is included in the jurisdiction of the Cour Royale and University Academy of Orléans, and belongs to the 1st Military Division, of which Paris is head-quarters. Under the monarchy it returned 5 members to the Chamber of Deputies; it now has 8 representatives in the National Assembly.

(*Dictionnaire de la France; Statistique de la France; Annuaire pour l'An* 1849.)

LOKEREN. [FLANDERS, EAST.]

LOKMÂN. There are various traditions about Lokmân, the supposed author of the collection of fables in Arabic, which still exists under his name. It has been conjectured that Lokmân and Æsop were the same individual. This supposition is founded on the close correspondence of the traditional accounts of the person, character, and life of Lokmân with those of Maximus Planúdes respecting Æsop.

The fables of Æsop have by no means the character of ancient and original Greek compositions. Many of them are strongly marked with an Oriental character. They bear a very striking resemblance to the Indian fables in the 'Panchatantra.' In the fables of Lokmân the same peculiar features frequently occur. Hence we may safely infer that both collections were originally derived from one common source, the Indo-Persian entertainment of this description: from this source certainly came the fabulous work attributed to Syntipas, who was no other than the Sindbad of the 'Arabian Nights.'

The fables of Lokmân show evident marks of a later and traditional origin. The moral or application is frequently misunderstood, or at least ill adapted to the apologue; a few ancient expressions had then become obsolete and are interpreted by words of more modern origin; and the language in general exhibits some slight deviations from grammatical accuracy, and approaches nearer to the modern Arabic idiom; as, for instance, in the use of the oblique case instead of the first case. The style is easy and flowing. The fables have often been reprinted for the use of those who are beginning to study the language, after the first edition, with a Latin interpretation, by Erpenius, Leyden, 1615: the best and latest editions are by Cousin, Paris, 1818; Freytag, Bonn, 1823; and Roediger, Halle, 1830.

LO'LIUM, a genus of Grasses, containing a few species common in many parts of the northern hemisphere. There are two species which require notice. *L. perenne*, the common Ray-Grass or Rye-Grass of the farmer, one of the most valuable of our pasture grasses. *L. temulentum*, or Darnel, which grows not only in all parts of Europe, but in Japan, New Holland, China, and Monte Video. Darnel is remarkable as being the only well authenticated instance of a plant belonging to the order of Grasses, in which narcotic or even delete

rious properties have been found. The grains are said to produce intoxication in man, beasts, and birds, and to bring on fatal convulsions.

LOLLARDS, a religious sect which arose in Germany at the beginning of the fourteenth century, and differed in many points of doctrine from the Church of Rome, more especially as regarded the mass, extreme unction, and atonement for sin. It took its name, according to some writers, from Walter Lollard or Lolhard, who was burnt alive for these doctrines at Cologne in 1322. Lollard subsequently became a term of reproach for all heretics, who were supposed to conceal erroneous doctrines under the appearance of piety; and in England, at the close of the fourteenth century, it was given to the followers of Wicliffe.

LOMBARD, an ancient name in England for a banker, was derived from the Langobardi or Lombards, a company of Italian merchants, the great usurers of the thirteenth century, who appear to have settled in England before the year 1274, and took up their first residence in a street of the city, still called from them Lombard Street.

LOMBARDIC ARCHITECTURE. This style of architecture may be considered the generic style which prevailed after the extinction of the Roman until the appearance of the Pointed or Gothic. It is the intermediate link between them. Though we are accustomed to regard the Lombardic historically as a distinct style, it was in fact only a further development of the system introduced during the decline of Roman architecture, which applied small orders merely as decoration, and introduced tiers of arches of which the piers form the solid supports of the structure.

Whether forming porticoes and galleries, or applied merely as decoration, these arcades are generally small in proportion to the building itself, and, instead of occupying the entire width of the front, or other elevation, are mostly inserted into distinct compartments of it, and are slightly recessed within the general face of the wall.

Among the other peculiarities of this style, that arising from small open galleries immediately beneath the cornice or roof is too remarkable to be overlooked, especially in gable fronts, where the arches of such galleries follow the slope of the roof itself, the columns being successively elevated one above another on steps (so that the base of those supporting the centre arch are above the lower arches), or else by placing the columns on the same horizontal line, and gradually increasing their height, as in the front of Pisa Cathedral. To this may be added the very prevalent custom of making an upper cornice or border of very small interlacing arches, or rather of mouldings producing that appearance. Pinnacles are of rare occurrence, and when introduced are generally low, and somewhat resemble pedestals.

LOMBARDO-VENETIAN KINGDOM, a state of Northern Italy, composed of the former duchies of Milan and Mantua, and of the territory of the late republic of Venice. The history of its formation as a kingdom is given in the next article, LOMBARDY and LOMBARD CITIES. The northern boundaries of the Lombardo-Venetian kingdom are formed by the Alps of Friuli, and the Carnic and Rhætian Alps; the western by Lago Maggiore and the river Ticino; the southern by the river Po; and the eastern by the Adriatic. The countries which adjoin it are—Carinthia, Carniola, Tyrol, Switzerland, Piedmont, Parma, Modena, and the Papal States.

The Lombardo-Venetian kingdom is governed by a viceroy, who resides at Milan. It consists of two great administrative divisions: 1, Provincie Lombarde, or government of Milan; and 2, Provincie Venete, or government of Venice. These divisions acknowledge for their respective political heads the governors of Milan and Venice. Each division is subdivided into provinces called Delegazioni, at the head of which is a delegate; each province into districts, at the head of each of which is a commissary, and each district into communes, with a podestà for its local magistrate. The provinces are described under the following heads: Lombard provinces—BERGAMO; BRESCIA; COMO; CREMONA; LODI E CREMA; MANTOVA; MILANO; PAVIA; VALTELLINA. The Venetian provinces are described under BELLUNO; PADOVA; ROVIGO; TREVISO; VENEZIA; VERONA; VICENZA; FRIULI, or UDINE.

The whole population of the kingdom in 1842 was—Lombardy, 2,600,760; Venice, 2,202,529.

The governor of each of the two great divisions, of Milan and Venice, is, according to the regulations of the kingdom, and without reference to the anarchy existing at the present time (May 1849), assisted by a provincial assembly, consisting of landholders and deputies from the royal towns, of which there are several in each province. Every province returns two landowners as deputies, and every royal town returns one deputy. The communal councils select three persons, out of whom the Emperor of Austria, as King of Lombardy, chooses one as a deputy. The deputies are elected for six years. These councils are local boards of administration. In every head town of a province there is a provincial congregation, who concern themselves especially with the administration of the municipal and communal finances of their respective districts.

The administration of the Lombardo-Venetian kingdom since the Restoration has paid peculiar attention to the material improvements of roads, bridges, canals, dykes, and other public works. Among the most useful enterprises have been, constructing or repairing the dykes in the province of Mantua; completing the great canal called Naviglio; making roads in the mountainous districts of Bergamo, the great commercial road of the Splugen, and the road over the Stilfer Joch to Como and Lecco; completing the cathedral of Milan; building the splendid bridge at Buffalora on the Ticino; and other great works. Railways have also been constructed from Milan to Monza, 12 miles, Milan to Trevilio, 18½ miles, and Venice to Vicenza, through Padua; and others are in progress.

The towns of Lombardy, such as Brescia, Bergamo, Como, and Milan above all, had been embellished, and were increasing in population till the beginning of 1848; but subsequent wars and sieges have injured most of the towns, es-

pecially Brescia, which has been nearly destroyed. Venice had been silently decaying for a century before its fall; and Bonaparte, by subverting its national government, nearly completed its ruin. Whatever may have been the faults of Austria in the government of her Italian dominions, she has made great exertions to raise Venice from the deplorable condition to which that state had fallen; and the favourable results of those exertions were perceptible to those who knew the city in 1814 and 1848.

In the department of popular education the Austrian government has extended to the Lombardo-Venetian kingdom the same general and uniform system which it had already established in its German states, and which is one of the most complete in all Europe. The elementary schools were first opened in Lombardy in 1822, and ten years after there was hardly a commune (of which the whole number is 2234) without its school, whilst several of the more extensive and populous communes had two. In these schools there is upon an average one teacher for every 40 pupils. Corporal punishment is strictly forbidden. The tuition is gratuitous, the schools being supported from the communal fund.

In the upper elementary schools of the chief towns there are courses of methodical teaching for those who are intended for schoolmasters. There are numerous Sunday-schools, public boarding-schools, private day-schools, and infant schools. From the upper elementary schools, boys who intend to pursue their studies pass into the gymnasia, of which there is one in almost every town, and about 66 in the whole kingdom. Besides the gymnasia, there are about 40 private institutions for youths, approved of by the government, which exercise an inspection over them. Above the gymnasia are the Lycea, of which there are 12 in the whole Lombardo-Venetian kingdom, devoted to philosophical studies. Lastly, the two universities of the kingdom, Padua and Pavia, supply instruction in all professional branches of learning. The combined result of all these establishments is, that education is more attended to in Austrian Italy than in any other part of the Italian peninsula.

The Austrian civil and criminal codes are in force in the Lombardo-Venetian kingdom. Every species of torture has been abolished since the reign of Joseph II. The Austrian penal code has also abolished the penalty of confiscation, which the code of Napoleon retained in certain cases. Religious toleration is guaranteed by the Austrian laws. The Protestants have a chapel at Venice, and another at Bergamo. The Greek or Eastern communion has a church at Venice; and the Jews have synagogues at Venice, Mantua, Padua, and other towns. The hierarchy consists of two archbishops, of Milan and Venice, the latter of whom has the rank of Patriarch, and eighteen bishops. The judiciary consists of a Tribunale di Prima Istanza, both for civil and criminal matters, in every head town of a province; of two courts of appeal, one at Milan and the other at Venice; and, lastly, of a supreme court for the whole kingdom, called the Senate, which sits at Verona. Two commercial courts are established, one at Milan and the other at Venice. In each of the smaller towns is a Pretore, or inferior judge. The military and naval arrangements of the kingdom have been thrown into such disorder by recent events, that it would be useless to specify them.

The Lombardo-Venetian kingdom is generally one of the most fertile countries of Europe; and the industry of the inhabitants, and the extensive system of irrigation, increase the natural fertility of the soil. Lombardy produces in abundance every thing that is necessary for th sustenance of its population — corn, wine, rice, fruits, cheese, and excellent meat. The chief articles of export are silk, rice, cheese, and hemp. The chief manufactures are silk, glass, paper, bronze works, and straw hats; but Lombardy is essentially an agricultural country, and receives most of the manufactured goods which it uses from the other parts of the Austrian monarchy. The bookselling and publishing trade, although subject to the censorship, is (in peaceable times) more flourishing at Milan than in all the rest of Italy put together.

LOMBARDY and LOMBARD CITIES. The name of Lombardy, which is derived from that of the Longobards, its former possessors, has been applied in its widest sense, though with no very definite limitation, to that tract of country which the Romans called by the name of Cisalpine Gaul, and which includes the principal part of the basin of the Po. It consists chiefly of an immense plain, 200 miles long, and from 60 to 70 miles wide, from the Alps to the Apennines. [Po.]

The overthrow of the kingdom of the Longobards [Longobards] by Charlemagne did not destroy the political existence of that people. They retained their laws and institutions, their property, and their numerous and powerful nobility; they continued a nation and a kingdom, subject however to the monarchy of the Franks. Although on the one hand the nobles fostered a feudal spirit, yet on the other the towns began to rebuild their walls, which had been razed by the barbarians. The towns had retained the ancient system of municipalities, and the citizens elected their own magistrates.

After the deposition of Charles the Fat in 888, the crown of Italy was disputed for about seventy years among a succession of pretenders, Italians and Burgundians, until Otho I. of Saxony seized it with a firm hand, and was crowned at Rome by the Pope, A.D. 961. Otho and his successors resided chiefly in Germany; and the Lombard nobles and towns, though nominally dependent on the emperors, were in fact nearly independent.

Towards the middle of the eleventh century discord first began to break out in Milan and other cities between the various classes of the population. The lower nobility strove against those of higher rank, and the townsmen lent their aid in such a way as to increase their own municipal influence. On one occasion, in 1041, the plebeians or burghers rose against the whole class of nobles, owing to some insult offered by one of them to a common citizen; and the result was a conflict of three years' duration. In 1059 began the long

struggle at Milan and in the rest of Lombardy on account of the married clergy. After a contest of many years, the Archbishop of Milan came under the power of the Pope; and the papal discipline was enforced of not admitting any married man to orders.

In the great contest of the investitures, the Lombard cities first aided one side and then the other; and it was during this long struggle that the cities really established their independence, acknowledging no longer the imperial missi, or vicars. The citizens then began to elect a certain number of magistrates, whom they styled consuls, who administered justice and commanded the militia. The rural nobles inscribed themselves among the citizens, and came to reside, at least for part of the year, in the city, in order that they might participate in the political rights. The towns governed themselves in all essential matters, but they owned allegiance to the Emperor in certain particulars. No sooner however had the towns secured their municipal privileges than they began to fight among themselves; and for a long period Italy was disgraced by brutal contests, in which nearly the whole of the towns were engaged. After a long series of these municipal rivalries and battles, the Emperor Frederick, in 1162, succeeded in quelling a war in which Milan had been especially conspicuous, and in destroying that city. But he so misused his advantage as to raise up a general spirit of resistance against him. In April 1167, a secret conference was held by deputies of the various cities; and it was resolved to form a league for the common protection, and to assist the Milanese in rebuilding their city. Pope Alexander III. declared himself protector of the Lombard league, which consisted of fifteen cities: Cremona, Bergamo, Brescia, Ferrara, Bologna, Modena, Milan, Parma, Piacenza, Verona, Vicenza, Padua, Venice, Treviso, and Lodi. The league was afterwards joined by Ravenna, Rimini, Reggio, Bobbio, Tortona, Vercelli, Mantua, and Novara. After a severe struggle the towns succeeded against the emperor, and brought about the Peace of Constance in 1183. By this treaty the cities were confirmed in their independent administration; they had the right of declaring war, of coining money, and other sovereign privileges, but acknowledged a sort of general obedience to the emperor in certain matters. No sooner, however, was this great contest ended than the towns recommenced their struggles with each other, and the contests between rival parties in each town began again. The annals of Italy for the 13th century consist of little else but details of these encounters. It has been said that notwithstanding all these feuds the Italian free cities prospered. The real truth is, that some of them flourished at the expense of the others. It is observed that a number of towns which are mentioned as being of importance in the eleventh century had disappeared in the thirteenth. We read of the glory and wealth of Milan and Florence, but we take no account of the depopulation and calamities of Lodi and of Pisa. Several causes contributed to keep up the wealth of the great Lombard cities during the middle ages: the extraordinary fertility of their territory, their manufactures, in which they were unrivalled in Europe, and the practice of their citizens of lending money at high interest throughout Europe, from whence the name of Lombard became synonymous with that of banker as well as usurer.

In the contests between the popes and Frederic II., in the middle of the 13th century, the Lombard cities were divided; and this division increased the anarchy which resulted from mutual jealousy and feuds. In 1260 Martino della Torre was chosen by the towns of Lodi and Novara as their 'signore,' or lord. The fashion spread; Cremona chose for its lord the Marquis Pelavicino; Verona chose Martino della Scala; Mantua the Count San Bonifazio; Ferrara the Marquis of Este, &c. Martino della Torre having died in 1263, his brother Philip succeeded him as lord of Milan, Lodi, and Novara, to which he added Como, Vercelli, and Bergamo, which towns elected him as their lord. Thus the foundation was laid of that consolidation of Lombardy into one state which in after-times was known by the name of the Duchy of Milan. The Archbishop of Milan, Otho Visconti, became 'Perpetual Lord of Milan,' in 1277; and his descendants, in the 14th century, ranked among the most powerful Italian princes. They extended their dominions not only over Lombardy Proper, but south and west of it. Gian Galeazzo Visconti received in 1395, from the Emperor Wenceslas, the title of 'Duke of Milan and Count of Pavia.' The charter of investiture included twenty-six towns and their territories, extending from the hills of Montferrat to the lagoons of Venice. Besides these he obtained also possession by force or fraud of Genoa, Lucca, Pisa, Siena, Perugia, Bologna, and other parts of Romagna. In the following century the duchy of Milan became circumscribed within narrower limits. The Venetians took the three provinces of Brescia, Bergamo, and Crema. The Swiss took possession of Bellinzona, and other valleys north of the Lago Maggiore. The duchy of Milan likewise lost its conquests south of the Po. The duchy of Milan, as it came into possession of Charles V., extended about 70 miles north to south from the Alps to the Po, and 60 miles east to west. Its principal cities were Milan, Pavia, and Cremona. Mantua formed a separate duchy until the war of the Spanish succession, when it was taken possession of by the house of Austria, and annexed to the duchy of Milan. These two duchies constituted Lombardy Proper. The duchy of Milan, during a century and a half that it remained under the Spanish branch of the house of Austria, declined greatly from its former prosperity; but, with its transfer to the German branch of the house of Austria, Lombardy began to recover its prosperity. Under Maria Theresa and Joseph II. especially, Lombardy advanced greatly in prosperity. Austria continued to govern these united states till Bonaparte's invasion of 1796. By the peace of Campo Formio of the following year, and by the peace of Luneville, the states of Lombardy were detached from Austria. Milan and Mantua, or

Lombardy Proper, were first constituted as a Cisalpine republic, then as an Italian republic, with Bonaparte as president, and were afterwards formed into a kingdom, of which Napoleon made himself king in 1805; and subsequently they were incorporated with Venice, Modena, and other states, into the 'Kingdom of Italy.' In 1814 the Austrian and allied forces occupied the kingdom of Italy, and the Emperor Francis again took possession of his former territories of Milan and Mantua, and also of Venice; and this measure was confirmed by the congress of Vienna. The districts south of the Po were restored to their former sovereigns; Modena to its duke, and the Legations and Marches to the Pope. The Emperor Francis then constituted the territory of Milan, Mantua, and Venice into a kingdom, styled Lombardo-Veneto, which was annexed to the imperial crown of Austria.

This Italian kingdom, thus subjected to a foreign domination, has made many struggles against its government. In the spring of 1848 the Austrians were driven out of Milan, Venice, and many other towns, and an alliance was formed between these towns and the King of Sardinia. The Austrian army however, under Marshal Radetzky, has succeeded (May 1849) in defeating the King of Sardinia, and in bringing Lombardy, with the exception of Venice, again under the Austrian sway.

LOMBARDUS, LAMBERT, the designation of a painter whose real name is not known. He is sometimes called Lamprecht Susterman, or Suterman, and, according to some, Lambert Suavius, and also Lamprecht Schwab. The place of his birth is equally unknown: it is said to be Liège or Amsterdam, more probably Liège, as he settled there after his return from Italy in 1538, and he died there in 1560, aged 54. Vasari mentions Lamberto Lombardo as the most distinguished of all the Flemish painters. His works consist chiefly of drawings with the pen in chiaroscuro: his coloured paintings are scarce. Lambert's style is strictly Italian. There are many prints supposed to be after Lambert's designs, some of which are marked Lam. Lombardus, and others Lam. Suavius.

LOMBEZ. [GERS.]

LOMBOK, an island of the Indian Archipelago, lying between 8° and 9° S. lat., and 116° and 117° E. long. It has the island of Bally on the west, and that of Sumbhawa on the east. The form of Lombok is nearly square, its mean length and breadth being respectively 53 and 45 miles. The surface of the island is mountainous, and one of the loftiest peaks is said to rise to the height of 8000 feet above the level of the sea. The island is populous and well cultivated. The ruler or rajah of Lombok is tributary to the sultan of Bally. [BALLY.]

LOMOND, LOCH. [DUMBARTONSHIRE.]

LOMONOSOV, MICHAEL VASILIEVITCH, the father of modern Russian poetry and literature, was born in 1711, near Kholmogor, in the government of Archangel. His father was a serf of the crown, and by occupation a fisherman. The long winters were devoted by Michael to study, and, though his stock of books was very small, he made diligent use of them; and, being desirous of further instruction, he made his way to Moscow, where he distinguished himself so much as to obtain patronage, and to be sent first to the university of Kiev, and afterwards to the Academy of St. Petersburg in 1734, where he applied himself to mathematics, physics, chemistry, and mineralogy. After two years he was sent to Marburg to perfect himself under Christian Wolff, whence he proceeded to Freyburg, for the purpose of acquiring a practical knowledge of metallurgy and mining. He was made an associate of the St. Petersburg Academy in 1741; in 1746, professor of chemistry, and in 1760 rector of the university. He died April 4, 1765.

It would be difficult to name any one who can be compared with him for the encyclopædical multifariousness of his writings. Chronology, history, grammar, rhetoric, criticism, astronomy, physics, chemistry, meteorology, poetry, all engaged him by turns, and he showed himself to have a genius for all. Polevoi's biographical novel, entitled 'M. V. Lomonosov,' 2 vols. 8vo., 1836, contains almost all that can now be collected regarding the life of this extraordinary man.

LONCHO'PTERIS, a genus of fossil ferns established by M. Adolphe Brongniart. The species belong principally to the coal formation; but one, *Lonchopteris Mantelli*, is found in the Wealden deposits and in the green-sand.

LONCHU'RA, a genus of *Fringillidæ*, or Finches, characterised by Colonel Sykes ('Proceedings of the Zoological Society,' 1832-1834). Three species are found in the Deckan, two being restricted to the Ghauts.

LONDON, the capital of the United Kingdom of Great Britain and Ireland, stands a little below the head of the navigable tideway of the river Thames. The centre of the dome of St. Paul's cathedral, which stands nearly in the centre of what is strictly the *City* of London, is in 51° 30′ 47.59″ N. lat., and 5′ 48.2″ W. long. This portion of the metropolis, the City, including the liberties, or the districts into which the municipal franchises and privileges extend, is divided into two portions: London within the Walls, and London without the Walls—a distinction which exists no longer except in name. The original wall of the city began at a fort which in part occupied the site of the present Tower of London, whence it was carried northward through the street now called the Minories to Aldgate; thence diverging to the west it crossed Bishopsgate churchyard to Cripplegate; then southerly to Aldersgate; thence to the north of Christ's Hospital; turning directly south to Ludgate, it then again took a westerly course to New Bridge Street, and accompanied the line of the Fleet River to its junction with the Thames, where another fort marked its termination. The space within the line thus described comprehends London within the Walls, and includes 98 parishes. London without the Walls consists of 11 parishes; besides inns of court, hospitals, and other extra-parochial districts locally connected with the above-named parishes. The whole of London Bridge is held to be within the city, together with a plot of ground at the south

end of the old London Bridge on the Surrey shore, and called the Bridge-foot. The borough of Southwark, and a part of the manor of Finsbury, are for certain purposes considered to be within the jurisdiction of the city. But the city forms only a small part of the metropolis, or of London in the large sense of the term, which comprehends the city of London within and without the walls, the city of Westminster, the borough of Southwark, and the newly created parliamentary boroughs of Finsbury, St. Mary-le-bone, the Tower Hamlets, and Lambeth.

The area of these several divisions, with the number of houses and of inhabitants which they contained at the census of 1831, were—

Inhabitants . . .	1,375,237
Houses	215,039
Acres	31,498

The increase of population during the next ten years, over the same area, was about a quarter of a million; but the metropolis, according to the limits adopted by the Registrar-General of Births, Marriages, and Deaths, now includes (in addition to all the parishes and districts enumerated above) Bow, Bromley, Chelsea, Deptford, Fulham, Greenwich, Hammersmith, Kensington, Stoke Newington, and Woolwich. In this enlarged sense the metropolis contained, in 1841,—

Inhabitants . . .	1,873,676
Houses	265,553

The registrar-general, taking this census as a basis, and allowing for subsequent births, deaths, emigration, and immigrations, makes the following estimates:—

1846	2,106,540
1848	2,172,386
1850	2,240,289

The principal thoroughfares follow the course of the Thames from east to west: those from north to south are shorter. From Kensington to Blackwall there is an uninterrupted mass of houses, eight miles in extent in a straight line, or nearly nine miles along the main line of street.

London, for the most part, stands on a bed of clay, from 100 to 200 feet thick. The mean annual temperature is about 50°. The mean annual quantity of rain is about 24 inches. The most prevalent winds are from the W. and S.W.

Ancient London.—London is known to have existed as a town at least as early as the reign of the Emperor Nero. The first notice of *Londinium* occurs in Tacitus ('Ann.,' xiv. 33), where it is spoken of as not then honoured with the name of a colonia, but still as a place much frequented by merchants, and as a great depôt of merchandise. At a later date London appears to have been made a colonia under the name of *Augusta*. (Amm. Marcell., xxvii 8.) The ancient wall is supposed to have been built by Theodosius, the Roman governor; it had 15 towers. The prætorium and its adjuncts are supposed to have occupied the site of the Poultry and Cornhill.

In regard to Anglo-Saxon London, our information is as scanty as it is with respect to the Roman city. In the sixth century it became the capital of the Anglo-Saxon kingdom of Essex, and in the following one a bishop's see. Sebert, king of Essex, having been converted to Christianity, erected a cathedral church to St. Paul, and an abbey church to St. Peter, on the sites of the present cathedral and Westminster Abbey. At this period, and for long after, the city could have been little more than an assemblage of hovels, intersected by narrow miry lanes, the whole inclosed by walls, except on the side towards the river. The residence of the Anglo-Saxon kings is supposed to have been near what is now termed Doctors' Commons; whence it was removed to Westminster by Edward the Confessor.

For many ages the public buildings of London were chiefly religious houses and hospitals, both of which were very numerous previous to the Reformation, and of several of them the names are retained at the present day. What few residences there were of any note were scattered about, and mingled with the meanest habitations. As to the actual appearance and condition of the metropolis we have little more than conjectural and piecemeal information until we come down to times that may comparatively be termed recent. We know, however, that in 1532 the streets were 'very foul and full of pits and sloughs, very perilous and noyous as well for all the king's subjects on horseback as on foot;' and that they were in total darkness at night. It is no wonder that such a city suffered much from the plague in 1665, and from fire in 1666.

During the 16th century the metropolis greatly extended itself westward along the north bank of the river, where many of the nobility erected stately mansions, and the names of several of them are still retained in the streets opening into the Strand.

Of the older architecture the metropolis retains some fine specimens, though they are not numerous. Westminster Hall, built by William Rufus; Westminster Abbey, by Henry III., with the splendid addition of the chapel of Henry VII.; the Temple Church, which has been restored in most excellent taste; and St. Mary Overies (or St. Saviour's), in which the restoration of the Lady Chapel has been very successfully effected, are the principal. Of a more modern date is the Whitehall of Inigo Jones.

London after the Great Fire.—The terrible destruction of St. Paul's Cathedral, numerous other churches and public buildings, and about 13,000 houses, by the great fire of 1666, opened the way for an improved construction of the city. Plans were suggested for this purpose by Sir Christopher Wren and Sir John Evelyn; but both were neglected, and London was rebuilt without any general or comprehensive system having been adopted. Sir Christopher however was enabled to erect the cathedral of St. Paul's, though not according to the plan he would himself have preferred, a model of which is preserved in the present cathedral. The edifice is in the Italo-Roman, and the exterior is magnificent and picturesque. To Sir Christopher Wren we also owe the Monument, St. Bride's, St. Stephen's, St. Dunstan's in the East, and many other churches of great beauty either in the whole or in parts.

The next hundred years from this date the metropolis extended itself considerably to the west and north-west. Soho Square and Golden Square were built before the close of the 17th century; Hanover and Cavendish Squares appear to have been erected between 1716 and 1720. In 1700 Old Bond Street was partly built, but its situation was then almost rural, all to the north being fields, lanes, and uncovered ground. Of the architecture of the period the churches of St. George, Bloomsbury (1731), St. Martin's, and St. George, Hanover Square (1742), erected during the reign of George I., are the best specimens.

It was not till the beginning of the reign of George III. that the metropolis began to put on a civilised appearance, by the safety and convenience of the public being attended to. Sign-posts, waterspouts, and all similar nu sances and obstructions were removed; footpaths were laid down, and lamps were lit at night. But architecture did not improve in an equal degree. Somerset House, the older portions of the Bank, the Adelphi, Portland and Stratford Places, two sides of Fitzroy Square, and the Pantheon, in Oxford Street, were among the new streets and buildings of the latter half of the century.

The present century opened with a large increase of private buildings, of which squares formed a considerable part, with no marked architectural character. Covent Garden Theatre led the way to a number of new structures devoted to the drama and purposes of exhibition. Coming down later, we have the Regent Street and Regent's Park improvements, which have certainly led the way to a taste for a degree of architectural display which would formerly have been considered quite prodigal. The alterations occasioned by the building of New London Bridge, and forming approaches to it, in consequence of the change of site, greatly changed that part of the city, and awakened a spirit of improvement in that part of London, which has been evinced by the alterations around the new Royal Exchange, by the building of Prince's Street, the widening of Lad Lane, and by similar improvement in other parts of the city. The new streets from Oxford Street to Holborn, from St. Giles's to Long Acre, from Coventry Street to Long Acre, and from Spitalfields to the London Docks, are great improvements. The new street from Farringdon Street to Clerkenwell has been commenced, but remains unfinished. Other new streets are in process of formation through busy parts of the town.

With the exception of the terraces in the Regent's Park, Hyde Park Terrace near Bayswater, Carlton Terrace, Belgrave Square, and a few others, none of the newer ranges of private houses make any pretension to architectural decoration. Internally however the houses themselves are, in proportion to their size, far more commodious and better fitted up than those of half a century ago. All the newer parts of the town are likewise sufficiently airy and cheerful, owing both to the greater width of the streets themselves, and to the greater breadth of the foot-pavements and the areas before the houses. Many important architectural works, some of which are the chief

ornaments of the metropolis, also belong to this period: we may enumerate the Post-Office in St. Martin's-le-Grand, the Royal Exchange, the British Museum, Lincoln's Inn Hall, the New Houses of Parliament (yet incomplete), London, Southwark, and Waterloo bridges; a great number of churches, in the erection of which a great improvement of taste has been displayed; the North-Western and South-Eastern railway stations; many of the Club-houses, and several private edifices; and numerous edifices partaking of a public character, such as banks, insurance offices, hospitals, &c. Model Lodging-houses have also been erected, of which the one in Pancras-road is the largest.

In addition to the more obvious improvements as regards paving, lighting, and widening of streets, the water supply and the drainage have been greatly improved during the present century.

Although, in comparison with many other capitals, London is by no means rich in public collections of works of art, some advancement has of late been made even in this respect. The National Gallery, the British Museum, the Soane Museum, the increased facilities for visiting Westminster Abbey, the numerous Annual Exhibitions of Pictures, the Art Unions—all tend in this direction; to these may be added the Diorama, Colosseum, Cyclorama, Cosmorama, and numerous panoramic exhibitions. The two Zoological Gardens, the Botanical Gardens, and numerous scientific institutions, are improvements in another direction. Another class of establishments which, as now organised, may be said to be peculiar to our own times, are the club-houses, principally at the west end of the town, which in some degree partake of the nature of places of literary as well as convivial meeting.

One improvement of very recent date, though long before demanded by a regard to public health, is the formation of cemeteries beyond the suburbs. The first of these was Kensal Green Cemetery, opened in 1832; and it has so well met the requirements of the times, that several more have been since formed.

Besides Hyde Park, Kensington Gardens, the Green Park, and St. James's Park, the Victoria Park, at the east end of London, and the park now forming in Battersea Fields, afford the inhabitants of nearly all parts of the metropolis a liberal supply of public promenades.

The theatres and opera-houses in London amount to about 20. The music or concert rooms, detached from any place of refreshment, are very numerous, especially as many of the literary and reading institutions give concerts as a portion of their routine of attraction; and, in addition to this, there is a far larger number of music rooms attached to taverns and public-houses, where the purchase of refreshment is considered as the admission price to the concert. Coffee-rooms and chess-rooms, billiard-rooms, ball or assembly rooms, and exhibition rooms in great variety, are also among the sources of amusement in the metropolis. Fairs for toys and amusements are held periodically at various places in the outskirts: but the taste in this direction has declined; and the most important of the fairs, St. Bartholomew's, in Smith-

field, is almost extinct. The British Museum, the National Gallery, and other exhibitions of an instructive kind, are gradually drawing visitors from the classes which used to frequent fairs. The visitors to the British Museum, in 1847, amounted to 896,570.

Divisions and Corporate Offices.—This portion of our article must relate to the City of London alone, rather than to the metropolis as a whole. The City of London is divided, for ecclesiastical objects and for the management of the poor, into 98 parishes within the walls, and 11 without the walls. For municipal purposes the City is divided n 26 wards, each of which elects an alderman, and a number, according to its size, of common-councilmen, the whole number of which amount to 240; but the aldermen and common councilmen of each ward form likewise a ward-council, and have the control of many of the local affairs of the ward. One of the aldermen, usually according to seniority, who must, however, have previously served the office of sheriff, is annually chosen lord-mayor on September 29, and enters on his office on November, 9. Two sheriffs, who are also jointly sheriff of Middlesex, are also chosen annually. The various officers of the Corporation consist of the sheriffs, recorder, town-clerk, common-sergeant, under-sheriffs, secondaries, remembrancer, coroner, harbour-masters, police superintendents, &c.

In the City of London there are 89 companies or guilds, eight of which are practically extinct; and one other, that of Parish Clerks, is not connected with the municipal institutions of the city. Most of the companies possess what is called a *livery;* that is, a part of their body, under the name of liverymen, if they be freemen of the corporation, enjoy privileges which other freemen do not possess—such as voting for mayor, sheriffs, chamberlain, &c.

The City returns 4 members to the House of Commons. The right of election is in the freemen, being liverymen, and the inhabitant householders occupying dwellings of 10*l.* yearly value.

The revenue of the corporation of the City of London is derived from various sources, of which the following are the principal:—Rents and quit-rents; rents and navigation of Thames; fines for leases; markets, tolls, offices, and bequests; brokers' rents and admissions; freedoms sold; casual receipts; interest on government securities; sale of securities; sale of premises; freedoms and enrolments; and the amount probably approaches 200,000*l.* The chief items of expenditure are the following:—Orphans' fund; rents and quit-rents; Mansion-house expenses; expense of magistracy, police, and prisons; conservancy of river Thames; artificers' and tradesmen's bills; market charges; law and parliamentary expenses; charitable donations; salaries and allowances; disbursements; courts of aldermen and common council; bequests; insurance paid; interest and annuities; purchase of securities; debts discharged; purchase for lord-mayor's household.

Most of the companies are in possession of real property and money in the public funds, both for their own use, and on various trusts. The Irish Society is a corporation connected in a peculiar manner with the corporation of London. Its property is chiefly in the county of Londonderry, in Ireland.

Westminster is a city, but the municipal government was in the hands of the abbot and monks of St. Peter's Abbey until the Reformation. The dean and chapter now appoint a high steward, who holds his office for life, and who appoints a deputy, subject to the confirmation of the dean and chapter. The dean appoints a high constable, who is returning officer at the election of members of parliament, of whom it returns two, as also do Marylebone, Finsbury, the Tower Hamlets, and Lambeth, the right of voting in all being vested in the 10*l.* householders. None of these boroughs are corporate, and the local affairs are managed chiefly by parochial boards.

Police; Justice; Prisons.—Until comparatively a recent period, the police of the metropolis was very defective; but in 1829 the metropolitan police force was formed, and subsequently the city police. The latter has a jurisdiction within the city only; but the metropolitan force is spread throughout the villages which surround the metropolis on every side, as far as 10 or 12 miles from St. Paul's. The city police establishment had, in 1848, 6 divisions, 81 officers of various grades, and 498 policemen. The metropolitan police, in the same year had 120 stations, 18 superintendents, 117 inspectors, 480 serjeants, and 4460 policemen. The expenditure for the metropolitan police, in 1847, was about 330,000*l.*, chiefly raised by a rate on householders. There are further provided, for preserving the peace of the metropolis, nine police offices, each of which has three magistrates.

The sessions of the peace for the city of London are holden eight times in the year, at which the recorder is the acting judge. Quarter sessions are held for Middlesex at Clerkenwell, and at Westminster. The Central Criminal Court has twelve sessions in the year. This court was established, in 1834, for the trial of persons accused of treason, murder, felony, or misdemeanor: its district includes the whole of Middlesex, and part of Essex, Kent, and Surrey. The great bulk of the cases brought before the Central Criminal Court are larcenies, unaccompanied by violence. There are 13 prisons for the confinement of offenders within the metropolis. These are—Newgate, Giltspur Street Compter, Blackfriars Bridewell, Southwark Bridewell, Borough Compter, the prisons in Whitecross Street, Coldbath Fields, Tothill Fields, and Clerkenwell, the Penitentiary, Millbank, the Pentonville Prison, Queen's Bench Prison, and Horsemonger Lane Gaol. The arrangements of these prisons vary according to the class of offenders confined in them.

The Courts of Law are held each term at Guildhall, in the city of London, and at Westminster Hall. The Courts of Equity sit in Westminster Hall, Lincoln's Inn, and the Rolls in Chancery Lane.

Lighting, Sewerage, Water Supply, &c.—The whole of London is now well lighted with coal-gas. The sewers of the metropolis and adjacent districts, comprehending a circle of ten miles, measured from the Post-Office, were, until 1847,

divided into seven trusts, and placed under the management of as many boards of commissioners. But the Metropolitan Commissioners of Sewers, appointed in 1847, absorb the duties of all these boards except that for the City of London. The sewers in the city are about 47 miles in length. The expenses of making sewers are defrayed by a house-rate. A metropolitan survey is now (1849) in progress, with a view to the improvement of the general system of sewerage. No arrangements have been yet put in practice for making use of the refuse of London as manure, except one plan, which is in partial operation in the neighbourhood of Chelsea.

The paving and cleansing of the streets are, like the lighting and watching, paid for by a rate on the householders.

The inhabitants of the metropolis derive nearly their whole supply of water either from the Thames or the New River. The supply from the Hampstead and Highgate ponds, and from wells or pumps, is comparatively small. At present nine or ten companies manage the water-supply.

An important part of the police of a city consists in the measures taken for the prevention and extinction of accidental fires. These measures are now much more effectually treated in London by the Fire Insurance Companies than by the corporation or by parochial authorities. Until a recent date each of the insurance offices maintained its own engines and corps of firemen independently of all other similar establishments; but in 1833 the fire-offices became generally united for this purpose under one superintendent and a uniform system, each office subscribing towards the expense of the establishment in a certain agreed proportion. Under this arrangement, London is divided into certain districts, each of which is provided with one or more stations, a supply of engines and horses, and an efficient corps of the Fire-Brigade. As a further precaution, fire-escapes are placed every night in many public open places in London.

Production and Consumption.—That London is not commonly considered as a manufacturing town is owing to the more important aspects under which it presents itself, and not because of the absence of manufacturing industry. Manufactures of almost every kind are in fact carried on in the metropolis, and upon a scale of great magnitude. The largest breweries, distilleries, and sugar-refineries in the kingdom are in the metropolis. The manufacture of metals in almost every branch is carried on to a vast extent. Almost every kind of machinery, from the smallest wheels required by the watch-maker to the most powerful steam-engines, are made in London. The making of gold and silver articles, of optical and surgical and other instruments, tools of the best quality, and musical instruments, gives employment to numerous hands. Ship-building, with all its accessaries, rope-making, mast-making, block-making, anchor-making, &c., has always been actively prosecuted. There are also numerous chemical works on a large scale, tanneries, soap-manufactories, potteries, and dye-houses. Male and female clothing of all descriptions is made, not merely for the use of the inhabitants of the metropolis, but for the supply of wealthy persons in various parts of the kingdom and even in the British colonies. There are not much fewer than 1500 separate trades or occupations carried on in the metropolis. In respect to *professions*, if we take that of law alone, we find there are 2000 barristers, equity draughtsmen, special pleaders, conveyancers, and proctors, and 3200 attorneys, solicitors, and law agents, practising in London. The metropolis is also the great workshop of literature, science, and the arts. The number of books printed and published in all other parts of England is small in comparison with what is produced in London. Of newspapers there are 13 published daily; 8 in the morning, and 5 in the evening. There are besides about 30 weekly newspapers, and numerous others which appear at other intervals. These are distinct from the numerous unstamped periodicals.

It is not possible to state with any pretensions to accuracy the amount of consumption in London of any except a very few articles of general use, because such commodities are becoming less and less under Excise and Customs regulations. The cattle sold in Smithfield amount to nearly 200,000 annually; sheep, 1,600,000; calves, 25,000; and pigs, 250,000. But, besides these, a large amount of slaughtered meat is now brought to the metropolis by railway and steamers. There are 5000 licensed public-houses, besides beer retailers, and exclusive of inns, hotels, and wine merchants. There are 1600 butchers' shops, 2400 bakers' shops, and 2800 grocers and tea-dealers. The coffee-shops are now very numerous.

The grain and flour which entered the port of London in 1846 amounted to—

Grain	3,005,540	quarters.
Flour . . .	252,749	sacks.
Flour . . .	329,016	barrels.

The vessels which arrived in the Port of London with coals in 1846 were 10,488, of which 3737 were from Newcastle. The supply of coal for that year was—

	Tons.
Coastwise	2,920,367
Inland	33,629
	2,953,996

Religion, Education, &c.—There are about 260 churches belonging to the Establishment in the metropolis, taking this term in its wide sense. To these are to be added about 90 episcopal chapels, 150 Independent and Baptist chapels, and about 130 other chapels belonging to various denominations: making a total number of about 630 places of worship.

There are eight cemeteries in the vicinity of London, owned by joint-stock companies; viz. Kensall Green; Highgate; Abney Park; Tower Hamlets; Victoria Park; Brompton; Norwood; Nunhead. There are a few other small ones, besides those attached to places of worship or to particular parishes.

The societies for religious, missionary, and reformatory objects are upwards of 80 in number, exclusive of those which, under the designation of charitable or benevolent societies, have provided asylums for the sick and poor; and the

colleges, societies, and institutions for educational and scientific purposes, are, as may be supposed, extremely numerous.

Charities, Hospitals, &c.—The public charities and hospitals within the limits of the metropolis are very numerous, and many of them richly endowed. The royal hospitals of Greenwich for seamen, and of Chelsea for soldiers, are national establishments, and wholly independent of private support. Connected with these two hospitals are the Royal Naval Asylum at Greenwich and the Royal Military Asylum at Chelsea, for the education of the children of sailors and soldiers.

The charities connected with the corporation of London are—Christ's Hospital, better known as the Blue-Coat School, Bridewell and Bethlehem Hospitals, St. Bartholomew's Hospital, and St. Thomas's Hospital, all of which were founded by Edward VI. Christ's Hospital, which has a branch at Hertford for the junior scholars, maintains about 1400 boys, to whom good classical, commercial, and mathematical instruction is given The lord-mayor and corporation of London are directors of the hospital; there are besides about 350 governors. The children are admitted on the nomination of the directors and governors, who exercise their privilege in rotation. Bridewell Hospital, which is under the management of the same board of governors as Bethelehem Hospital, is now used only as a prison. Bethlehem Hospital, first erected in 1675 in Moorfields, was removed in 1814 to Saint George's Fields. It is employed for the reception and treatment of insane patients. St. Bartholomew's Hospital was founded in the reign of Henry I. for a priory of Black Canons, with a hospital attached. The priory and its hospital were dissolved at the Reformation; but the hospital had a new charter given to it by Henry VIII., endowing it 'for the relief of 100 sick and poor of the city of London.' Subsequent donations and endowments led to an enlargement of the plan, and of its utility as a hospital. St. Thomas's Hospital, in Southwark, is governed by the lord-mayor, aldermen, and 12 common-councilmen of London, and 180 governors through donations of 50*l.* and upwards. It is capable of receiving, and usually contains, nearly 500 patients; besides whom it affords relief to a considerable number of out-patients, who receive advice and medicines gratuitously. There is a medical school attached to this hospital. The other hospitals of the metropolis have been founded and are supported by private benevolence. They are extremely numerous: indeed, if we include Hospitals, Infirmaries, Dispensaries, Asylums, and Lying-in Hospitals, we find that the number amounts to about 140.

Trade, Post Office, Savings' Banks, &c.—The relative proportion of the foreign and colonial trade enjoyed by the merchants of London, as compared with those of other ports, may be shown from the fact, that out of a gross receipt of customs at all the ports of the United Kingdom of about 22,000,000*l.* sterling in 1845, the receipts in the port of London exceeded 11,000,000*l.*; that is, the customs receipts at London equal those of all the other ports combined; and this ratio has been about maintained for many years past. The shipping entries vary; but on the whole there is a constant progressive increase. In 1846 the amount was:—

	Vessels.	Tons.
From Foreign Countries .	8711	1,539,177
From the Colonies . .	1603	490,446
Coastwise	22,293	3,019,971
	32,607	5,049,594

There are about 50 wharfs on the north and south banks of the Thames, within the limits of the metropolis, besides the canal wharfs and the docks for the shipping destined to foreign countries.

The facilities for accommodating shipping are noticed under Docks. The railways from the metropolis are mainly accommodated at five large stations: viz. Euston Square, Paddington, Waterloo Bridge, London Bridge, and Shoreditch, besides a smaller station in Fenchurch Street, and goods' stations at Camden Town, Vauxhall, and Bricklayer's Arms. The chief canal of London is the Regent's Canal, which curves round the northern part of the metropolis from Limehouse to Paddington (whence it communicates with the northern and western parts of the kingdom), and has several basins and wharfs: the remaining canals are all short, and comparatively unimportant.

There is no port in the kingdom which has profited more than London through the application of steam to navigation. A great part of the steam-vessels that arrive and depart carry passengers only, and are therefore not required to make entry at the custom-house, and with regard to such as carry goods no distinction is made at the custom-house between them and sailing-vessels; for which reasons no accurate account of the number of this class of ships that enter and leave the port can be given. Steam passage-boats are passing and repassing daily between London and Chelsea, Kew, and Richmond, and in summer one goes up to Hampton Court; and between London and Greenwich, Woolwich, Gravesend, and other places, downwards; while, at less frequent intervals, steamers start from the Thames to nearly all the principal ports in the United Kingdom and throughout Europe.

The Post-office arrangements of London are on a vast scale. Letters are despatched every day from London to 4000 post-towns in England and Wales, 900 in Scotland, and 900 in Ireland. The weight of the mails (newspapers and letters) despatched from London by the general post in an average week has been found to be upwards of 70 tons. The money orders issued within the 3-mile circle, in 1847, amounted to 468,967, for an amount of 928,321*l.*; while those paid amounted to 953,079, for a sum of 2,035,617*l.* The postage collected in London, and the postage stamps sold in London, amounted together, in 1846, to 850,066*l.* The gross postage of the London *District* post in the same year was 283,772*l.*, of which 184,478*l.* were net receipts.

In illustration of the provident habits of the inhabitants (in the middle classes principally), it may be stated that there are upwards of 100

offices for Life and Fire Insurance in the metropolis. The Savings' Banks in London and Middlesex in 1846 were 38 in number; they had

Individual Depositors	190,260
Charitable Institutions	788
Friendly Societies	505

The total sum lying at interest in those Savings' Banks was 4,754,612*l*.

LONDON CLAY. The most considerable of the tertiary formations of Great Britain is thus designated, from its development in the valley of the Thames under and around the metropolis. It may be viewed in three parts, occupying the following series:—Upper part, 'Bagshot Sand,' in which several remarkable fishes have been noticed by Dr. Buckland. Middle part, 'London Clay,' containing a few bands of sand, nodules of septaria, and multitudes of marine shells. Lower part, 'Plastic Clays and Sands,' consisting of various coloured clays and sands, with lignite, and marine, æstuary, and fresh-water shells.

LONDON, NEW. [Connecticut.]

LONDONDERRY, a county of the province of Ulster in Ireland, bounded N. by the Atlantic Ocean, E. by Antrim and a portion of Loch Neagh, S. by Tyrone, and W. by Donegal. It lies between 54° 38′ and 55° 22′ N. lat., 6° 28′ and 7° 24′ W. long. The greatest length N. to S. is 40 miles; the greatest breadth E. to W. is 34 miles. The area is 810 square miles, or 518,595 acres. The population in 1841 was 222,174.

Surface and Rivers.—The county is of an irregularly triangular area. From the Bann the surface gradually rises westward for about ten miles, forming a chain of elevations which bound the valley of that river on the west. Westward of these elevations is an extensive tract of undulating country, extending from their bases to the eastern shore of Loch Foyle, and bounded on the south by the mountain range which separates the counties of Londonderry and Tyrone.

The Lower Bann, from Loch Neagh to the sea, a distance of upwards of thirty miles, has a fall of only 48 feet. The general characteristics of this district are similar to those of the north coast of the county of Antrim. The elevations are however inconsiderable, and the general aspect of the country is tame and bleak. West of the sand-banks which occur at the embouchure of the Bann the coast has a bolder outline, rising in a series of precipitous cliffs over the sandy beach. Among the loftiest basaltic cliffs are Benbradagh, 1531 feet high, and Craignashock, 1773 feet high. West of the valley of Ballynascreen commences a mountain-chain, which with little interruption extends to the valley of the river Foyle, forming the boundary between the counties of Tyrone and Londonderry. Its chief heights are Sawell, 2236 feet high; Muinard, 2057 feet high. The district included between these mountains and Loch Foyle, constituting the western division of the county, is divided by a central tract of high land into the valleys of the rivers Roe and Faughan.

Between the Lower Faughan and the Foyle is a range of undulating ground crossed by a valley through which the high road, leading over a bridge, completes the communication with Londonderry city.

The most remarkable feature of the coast line is the tract which extends from the north-western extremity of the hilly region to the low point of Magilligan and southward to the mouth of the Roe. On this tract is measured the base-line of the trigonometrical survey of Ireland, 53,200 feet in length. The same tract appears to occupy the greater portion of the bottom of the loch, and rises towards its centre in a bank which confines the navigation to that portion of Loch Foyle lying along the coast of Donegal. The loch is about 18 miles long by 10 broad. The entrance to the loch, between Magilligan Point and Enhishowen Head is about a mile across, and from this point to Londonderry city is a safe and tolerably sheltered navigation of 23 miles. Eastward of the entrance is a shoal called the Tuns, which renders the loch difficult of access in stormy weather.

The chief rivers of the county are the Bann, Foyle, Macosquin, Agivey, Clady, Mayola, Ballinderry, Roe, Faughan, Owenreagh, and Owenbeg. The roads of Londonderry are generally excellent. There are no canals. Railways are in progression from Londonderry to Enniskillen, and from Londonderry to Coleraine. A remarkable feature of the last-named scheme is, that the railway is to cross Loch Foyle on an embankment 19 miles long, as a means of inclosing and reclaiming 18,000 acres of land.

Geology, Soil, Productions.—The basaltic tract corresponds in all respects to the remainder of the field on the opposite side of the Bann [Giants' Causeway], with this remarkable difference, that the dip of the strata is reversed. The geological structure of the district may be described as a floor of primitive rock overlaid in part by a field of secondary formations, capped by basalt. The main constituent of the rest of the county is mica slate. Primitive limestone occurs in many places; and on the east side of Slieve Gallion there is a granular limestone, which contains quantities of crystallised hornblende: hornblende slate is found at several places in the valley of the Roe. The structure of the south-eastern extremities of the county is more complex, the varieties of formations which appear at the surface being numerous. There are no mines worked in this county.

The soil of that part of the valley of the Bann where the subsoil is hard basalt consists for the most part of a rusty loose grit, without sufficient strength or cohesion for wheat crops. Numerous tracts of bog, interspersed with shallow pools, and frequently separated by craggy knolls of basalt, are scattered over this part of the county. There are however tracts of good land along the banks of the several rivers which traverse the district, and especially at their junctions; and between the basalt and the primitive district farther west is a tract of rich open country, extending southward into Tyrone. This is the most extensive tract of good ground in the county. The best improved portions of the county are the district of Loch Neagh, the valley of the Roe,

the valley of the Faughan, and the immediate vicinity of Londonderry on both sides of the Foyle. There is a very general scarcity of timber.

The progress of agriculture in this county has been materially forwarded by the establishment of an agricultural school near Muff by the Company of Grocers of London, who here hold large estates under the crown. Oats and barley are the principal grain crops. There is but little land in pasture, and the breed of cattle, with the exception of pigs, of which great numbers are reared, is in general not much attended to. Of the 518,595 acres in this county, 163,087 were under crops in 1847; the chief crops were—corn and beans, 112,424 acres; potatoes, 8991; turnips, 12,766; meadow and clover, 18,441; flax, 8395.

The manufacture and bleaching of linens is the staple trade of the county. The most extensive bleach-greens lie along the rivers Roe and Faughan, on the latter of which there is abundant water-power and numerous sites admirably calculated for this branch of manufacture. The weavers and flax-dressers are numerous. The export and import trade of the county is carried on at the ports of Londonderry city and Portrush, the latter being the seaport of Coleraine.

Divisions and Towns.—Londonderry is divided into 4 baronies, and 2 liberties. It is chiefly in the diocese of Derry and Raphoe. It is in the North-Western Circuit, and the assizes are held in the city of Londonderry. The county returns 2 members to parliament, and 1 member is returned for the city of Londonderry, and 1 for the town of Coleraine.

The following are the principal towns, with the population of each in 1841:—

Coleraine is a parliamentary borough and port, situated 4 miles from the sea, on both sides of the Bann, over which is an excellent stone bridge of three arches. The town consists of a central square, and several diverging streets on the east bank of the river and in the county of Antrim, and a portion on the west bank called Waterside, or Killowen. It contains a town-hall, a market-house, 4 parish churches, 2 Roman Catholic chapels, 4 Presbyterian chapels, and 3 or 4 other chapels. A fine linen called Coleraines is made here, and there are paper, soap, leather, and other manufactures. Vessels of 200 tons' burden can discharge at the quay, and a brisk trade, chiefly by steam, is carried on with Liverpool through Portrush, the shipping port, 2 miles E. from the mouth of the Bann, and 6 miles from the town. The borough returns 1 member to parliament. Population, 6255.

Dungiven is a small town situated in a rich and sheltered vale watered by the Roe, about 17 miles W. by S. from Londonderry. Population, 1016.

Kilrea, is a small town on the west bank of the Bann, about 15 miles S. by E. from Coleraine. Population, 1191.

Londonderry, commonly called *Derry*, a county of a city, parliamentary borough, municipal borough, and seaport, in 54° 59′ N. lat., 7° 19′ W. long., 144 miles N.N.W. from Dublin, is situated on a hill, 119 feet above high water, which projects into the Foyle from the western bank, and 5 miles above the entrance of the river into the æstuary called Loch Foyle. The city is surrounded by an ancient wall, a mile in circumference, with 6 gates, beyond which the houses have been considerably extended. The streets radiate from a central square, and some of them are very steep. A wooden bridge 1068 feet long connects the city with the village of Waterside, on the eastern bank of the river. The principal public buildings are—the Corporation Hall, Custom House, County and City Court House, prison, lunatic asylum, the cathedral and 2 other Protestant churches, and 2 Roman Catholic, 6 Presbyterian, and 3 Methodist chapels. There are several flour-mills, 2 flax-spinning mills, 3 distilleries, 2 breweries, and 2 large rope-walks. The assizes for the county are held in the city. The river is at all times navigable for large vessels, and small craft can proceed about 7 miles higher, to Johnstown village, and barges by a canal to Strabane 14 miles. The quays are commodious, and allow vessels of 500 tons' burden to discharge at them. The port has some foreign and colonial trade; the coasting trade is considerable, and there are 7 steamers which ply to Liverpool, Glasgow, Greenock, Ardrossan, and Campeltown. The municipal borough is divided into 3 wards, and is governed by 6 aldermen and 18 councillors. Population, 15,196. The city returns one member to parliament.

Magherafelt is an improving town, with a sessions-house, union workhouse, and markets for linen, and very large monthly cattle fairs. It is situated 4 miles W. from the north-western angle of Lough Neagh. Population, 1560.

Newtown Limavady, a market-town, 16 miles N.E. from Londonderry, is situated on the east bank of the river Roe, and comprises 3 tolerably well built streets, and others not so good. It contains a market-house, union workhouse, a handsome church, and other places of worship. The town is respectably inhabited, and has a good retail trade. Population, 3101.

History and Antiquities.—At the most remote period this county appears to have been possessed by the septs of O'Loughlin and O'Neill. The establishment of an English garrison at Coleraine would appear to have enabled the English very soon after to reduce at least the eastern and central parts of the county into shire-ground. It is probable that the English law continued in force in the eastern parts of the county until the great revolt of the O'Neills in 1333. After that period the native Irish continued undisturbed masters of the country until the middle of the sixteenth century, when the rebellion of Shane O'Neill, A.D. 1566, made it necessary to send a force to Derry. In the year 1600, Sir Henry Dockura, with an efficient force, constructed three forts in the county; and this was the first commencement of a permanent settlement. The rebellion of Sir Cahir O'Dogherty in 1608, and the flight of Tyrone and O'Donnell in the preceding year, left the entire of this and five other counties at the disposal of the crown. On the 28th January, 1609, negotiations were commenced between the king and the corporation of London for the purpose of settling the terms on which the forfeited lands in this county should be

conveyed to the latter for the purpose of planting them with Protestant colonists. It was at first agreed that the Londoners should spend 20,000*l.* on the plantation, in consideration of which the king granted to them the old county and town of Coleraine, with the woods of Glanconkene and Killeightra, and the town and liberties of Derry, excepting the church lands. For the management of these estates, the common council elected a body of twenty-six, consisting of a governor, deputy-governor, and assistants, of whom one-half retire every year, their places being supplied by a new election. In 1619 this body was incorporated by royal charter, and their estates erected into one county, to be called the county of Londonderry. The corporation, which is generally known as 'The Irish Society,' still exists as constituted under the charter granted by Charles II. after the Restoration. The lands not assigned to the Companies still belong to the Society. The introduction of the new colony changed the entire face of the country, which, up to this period, had been one of the most desolate tracts in Ireland.

There are some remains of a Cyclopean fortress at the Giant's Sconce, on the road from Newtown Limavady to Coleraine. Dungorkin is a circular mount, surrounded by a wet ditch, near Claudy. There are several cromlechs, druidical remains, caves, and tumuli. Of military edifices the only remaining are the castles of Killoloo, Dungiven, Salterstown, and Muff. The old abbey of Dungiven, which occupies a romantic site on a rock rising 200 feet above the bed of the river Roe, and the old church of Banagher, are the chief ecclesiastical remains.

LONDONDERRY, ROBERT STEWART, MARQUIS OF, was born at Mount Stewart, county Down, Ireland, June 18, 1769. He derived his title from his father, who was of the peerage of Ireland. He was educated at the Grammar School of Armagh and St. John's College, Cambridge. In 1789 he was returned to the Irish House of Commons for Downshire, in the Reform interest, to which he pledged himself, but changed his politics about four or five years after, and went over to the Tories. He made his maiden speech in the English House of Commons, to which he had been returned for the borough of Tregony, Oct. 29, 1795, in seconding the address. He vacated his seat in July 1797; upon which he was re-elected to the Irish parliament for the county of Down, and was made Keeper of the Privy Seal for Ireland. In the beginning of 1798 he was made Secretary to the Lord Lieutenant and an Irish privy councillor. From this date he may be regarded as having been distinctly the ministerial leader in the Irish Commons, and he was no doubt one of the principal promoters of the union, which took place two years after. He sat for the county of Down in the Imperial Parliament from 1801 until 1805, when he was promoted from the presidentship of the Board of Control to be Secretary of State for the department of War and the Colonies. He resigned his office on the death of Mr. Pitt, but resumed it on the commencement of the Portland administration. He had meanwhile been returned for the borough of Plympton, Devonshire. The failure of the Walcheren expedition not only made him very unpopular, but involved him in a personal quarrel with Mr. Canning, who was severely wounded in a duel which terminated the affair.

Lord Castlereagh, on the resignation of the Marquess Wellesley, was appointed Secretary of State for the Foreign Department. To the parliament which met in November 1812, he was returned for the county of Down; and he also retained that seat in the next two parliaments.

Meanwhile, in 1813, he had gone as British plenipotentiary to the negotiations opened with the French government at Châtillon; and he had also appeared as representative of the King of England at the Peace of Paris, in May 1814; at the Congress of Vienna, in October of the same year; at that of Paris after the battle of Waterloo; and at that of Aix-la-Chapelle in 1818. He had been made a Knight of the Garter in 1818, and he became Marquis of Londonderry by the death of his father on the 8th of April, 1821.

Lord Londonderry died by his own hand at his seat of North-Cray-Place, in the county of Kent, on the 12th of August, 1822. A verdict of lunacy was returned by a coroner's jury.

LONG, ROGER, was born in the county of Norfolk about the year 1680. At the age of seventeen he entered Pembroke Hall, Cambridge, took the degree of Master of Arts in 1704, and that of Doctor of Divinity in 1728. The following year he was elected a Fellow of the Royal Society and Vice-Chancellor of the University; In 1749 he was appointed Lowndes' Professor of Astronomy, and in 1751 he was presented to the rectory of Bradwell in Essex, which he held until his death, December 16, 1770. His principal work is a treatise on astronomy, in two large quarto volumes, the first of which was published in 1742, the other in 1764; a second edition appeared in 1784. This work contains very good descriptions of the apparent motions of the heavens. He wrote a few other works, chiefly pamphlets and poems. With a view to popularise the science of astronomy, he caused to be constructed a hollow sphere, wherein thirty persons could sit conveniently, and on the inner surface of which was a representation of the heavens as they would appear to an observer on the northern hemisphere. The sphere is still kept in a room of Pembroke College, and a scholar receives 6*l.* a year for keeping the key.

LONG ISLAND. [NEW YORK.]

LONGFORD, an inland county of the province of Leinster in Ireland, bounded N.W. by Leitrim, N.E by Cavan, S.E. by Westmeath, and S.W. by Roscommon. It lies between 53° 29′ and 53° 56 N. lat., and 7° 19′ and 7° 56 W. long. Its greatest length, N. to S., is 29 miles; its greatest breadth, E. to W., is 22 miles. The area is 421 square miles. The population in 1841 was 115,491.

Surface and Rivers.—The general slope of the surface is westward and south-westward towards the Shannon, except in the north-eastern angle towards Cavan, where the county embraces a small portion of the basin of Loch Erne. This district, forming the immediate basin of Loch Gownagh, is

separated from the remainder of the county by a slightly elevated tract upon the south, and by a series of hills of low elevation on the west. Loch Gownagh is a very irregular piece of water, extending about five miles each way, but is rather a collection of lakes communicating by narrow channels than one sheet of water. Its chief feeders are small streams running from the surrounding hilly country. The hills, called the Cairn Clonhugh, present some summits nearly 1000 feet high. Between the western termination of the Cairn Clonhugh hills and the Shannon is an open well-cultivated tract. The south-eastern slope of these hills forms one side of the valley of the Camlin. The country through which the Camlin flows is open and well improved. The district intervening between the Keenagh and the Shannon, which along the south-western boundary of this county expands into the extensive lake of Loch Ree, is very flat and boggy. An inlet of this Loch, running about four miles eastward from the main sheet of the lake, bounds this part of the country on the south. Near the shore, in this direction, are the small lakes of Derry and Derrymacar. The valleys of the Camlin and Inny are separated by a low table-land, which rises into only one conspicuous eminence of 650 feet at Slieve Goldry. The only striking natural feature in this part of the line is Glen Loch, a sheet of water about a mile and a half in length.

The Shannon bounds the county on the west. The other rivers are the Clonard, Rinn, Camlin, Keenagh, and Inny. The Royal Canal runs through the county. A branch of the Midland Great Western Railway will, when completed, extend to the town of Longford.

Geology, Soil, Production.—The entire district south of the Camlin consists of floetz limestone, with the exception only of two patches of sandstone. The immediate valley of the Camlin on its southern bank, and the entire tract extending northward from it to the county of Leitrim, consist of clay-slate. Between these two lies a belt of yellow sandstone and conglomerate. The low gravel region, in which the eskers occur, contains large quantities of fine calcareous sand and marl. Marly clay also underlies many of the boggy tracts. A little millstone grit appears. Iron, coal, lead, and marble are among the mineral products. In the tract sloping towards the valley of the Inny is a rich vegetable mould, producing either heavy grain crops or sweet fattening pasture. The rest of the county is chiefly grazing land. Great quantities of butter are made by the farmers and cottiers. Pigs are reared in great numbers. The feeding of sheep is not much attended to. In 1847 there were 74,181 acres under crop, of which the chief crops were—corn and beans, 51,297 acres; potatoes, 1414 acres; turnips, 2925 acres; meadow and clover, 17,657 acres.

The linen manufacture is carried on with some activity in the neighbourhood of Newtown Forbes, where the first Earl Granard took pains to introduce it. The manufacture of coarse flannels and friezes for home consumption is also attended to throughout the country.

Divisions and Towns.—The county of Longford is divided into 6 baronies. It is in the diocese of Kilmore, Elphin, and Ardagh. It is in the North-Western Circuit, and the assizes are held at Longford. The county returns 2 members to parliament.

Ardagh is a small village, about 10 miles S.E. from Longford, with a population of 165. It was formerly the seat of a separate bishopric, but is now included in the united bishopric of Kilmore, Elphin, and Ardagh.

Ballymahon, a market-town, 12 miles S. by E. from Longford, is situated on the river Inney, which falls into Lough Ree about 3 miles W. from the town. The town consists chiefly of one very wide street, and contains a sessions-house, a church, a Roman Catholic chapel, and 1229 inhabitants.

Granard, a market-town, 14 miles N.W. by W. from Longford, contains a sessions-house, a union workhouse, a church, and a Roman Catholic chapel. The market receives weekly a large quantity of agricultural produce, but the trade of the town in other respects is not flourishing. Population, 2408.

Longford, the capital of the county, 76 miles N.W. by W. from Dublin, is surrounded by an extensive plain of bog, swamp, pasture-land, and arable land. It is watered by the small river Camlin, which falls into the Shannon four miles westward from the town. A branch from the Royal Canal terminates at Longford. The town consists of regular streets, and contains a county courthouse, county prison, union workhouse, barracks, a handsome church, a very fine Roman Catholic chapel of recent erection, and two or three places of worship for Dissenters. The assizes are held in Longford. The population in 1841 was 4966.

History and Antiquities.—The territory at present constituting the county of Longford was originally a portion of the kingdom of Meath, and as such was included in the grant of Meath by King Henry II. to Hugh de Lacy. On the erection of the district into a separate county, in the 11th of Elizabeth, it retained few or no traces of ever having been under the authority of the English law or government. A reparcelling out of the county took place in 1615. The plantation did not take effect to any great extent, as in 1641 the entire county appears to have been seized back by the O'Farrels, excepting only Longford Castle and Castle Forbes. The confiscations which ensued extended over nearly the entire county, and introduced almost totally a new proprietary.

Among the antiquities is the rampart of Duncla, which extends eight miles. On the island of Inch-Clorin, in Loch Ree, are the ruins of seven churches, and the foundation of a round tower. An abbey was founded here, about A.D. 540, by St. Dermid. There are the foundations of another round tower at Granard. The abbey at Longford was one of Patrick's foundations; on its site a fine monastery was built in 1400, the church of which is now the parish church. There are remains of the religious houses of Moydow, Clonebrone, Clone, Derg, and Innismore, a foundation of St. Columba's, on an island in Loch Gownagh. A few castles are still partially standing, of which

the principal are at Castle-Forbes, Granard, Tenallick, Castlecor, Rathcline, and Ballymahon.

LONGHI, GIUSEPPE, was born at Monza in 1766. He was taught engraving by Vangelisti at Milan, and he studied afterwards at Rome, where he became acquainted with Raphael Morghen. After his return to Milan he was chiefly employed in miniature painting, till he was ordered by Napoleon to engrave Gros's portrait of him. In 1798, on the death of Vangelisti, he succeeded him as professor of engraving in the Academy of the Brera at Milan. He was made a Knight of the Iron Crown, and was a member of many academies. He wrote a treatise on engraving, 'La Chalcographia,' and a few poems. He died in 1831. Many of the most distinguished Italian engravers of the present day were educated under him.

LONGICORNES, the fourth family of the tetramerous Coleoptera in Latreille's arrangement of insects. It includes a vast number of large and beautiful beetles, all remarkable for the length of their antennæ, which in many species are several times longer than their bodies. They inhabit woods, where the females deposit their eggs beneath the bark of trees, effecting the operation by means of a long, strong, horny ovipositor with which they are provided. The females are usually larger than the males. The larvæ live beneath the bark of trees or in the wood, in which they bore deeply, and do much damage. The greatest assemblage of species and the largest forms are found in South America; but longicorn beetles are very generally dispersed. This family is divided into three great groups, of which the genera *Prionus*, *Cerambyx*, and *Leptura* are the respective types.

LONGI'NUS, the author of a treatise in Greek 'On the Sublime,' is said to have been born either in Syria or at Athens. His education was carefully superintended by his uncle Fronto, a celebrated teacher of rhetoric; and he also received instruction from Ammonius and Origen. He afterwards settled at Athens, where he taught philosophy, rhetoric, and criticism, and numbered among his disciples the celebrated Porphyry. He finally removed to Palmyra at the invitation of Zenobia, in order to superintend the education of her sons; and he also took an active part in public affairs. After the capture of Palmyra by Aurelian, A.D. 273, Longinus was put to death by order of the emperor.

There is some doubt whether the treatise 'On the Sublime' (περὶ ὕψους) was written by this Longinus. The treatise 'On the Sublime' has for its object the exposition of the nature of the sublime, both as to the expression and the thought, which the author illustrates by examples. As a specimen of critical judgment the work has always maintained a high rank, and in point of style is perspicuous and precise.

The best editions of Longinus are by Pearce (1724), Morus (1769), Toup (1778), and Weiske (1809); the best translations are the German by Schlosser, the French by Boileau, and the English by W. Smith.

LONGIPENNES, Cuvier's family name for the long-winged oceanic birds, such as the *Petrels*, *Albatrosses*, &c. The genera which he includes in this family are *Procellaria*, *Puffinus*, *Halodroma*, *Puchyptila*, and *Diomedea*.

LONGIROSTRES, Cuvier's name for a family of wading birds, in which he includes the genera *Ibis*, *Numenius*, *Scolopax*, *Rhynchœa*, *Limosa*, *Calidris*, and *Tringa*, *Arenaria*, *Pelidna*, *Falcinella*, *Machetes*, *Hemipalama*, *Eurinorhynchus*, *Phalaropus*, *Strepsilas*, *Totanus*, *Lobipes*, and *Himantopus*,—the greater part of which, as he observes, would come under the great Linnean genus *Scolopax*. He remarks that one can hardly place the *Avosets* (*Recurvirostra*, Linn.) in any other position than at the end of the *Longirostres*.

LONGITUDE and LATITUDE. These terms mean different things as applied to a point of the earth, or a star in the heavens; and we must accordingly distinguish between *geographical* latitude and longitude, and *celestial* latitude and longitude.

The latitude of a star in the heavens is its angular distance from the ecliptic, measured on a great circle drawn through the star and pole of the ecliptic. It differs from the declination only in this, that the ecliptic is used instead of the equator. The longitude of a star is the angle made by the circle on which latitude is measured with the circle which passes through the pole of the ecliptic and the vernal intersection of the equator and ecliptic. Thus a star on the ecliptic has no latitude, and one which lies directly between a pole of the ecliptic and the vernal equinox has no longitude. The use of celestial longitudes and latitudes has in great measure been superseded by those of right ascensions and declinations.

The meaning of the term geographical longitude is the same whether we consider the earth as a sphere or a spheroid. It is the angle contained between the plane of the meridian of the place, and that of some one meridian which is fixed on as the starting-place. Thus we choose the Observatory of Greenwich, and the French that of Paris, as being in the first meridian; and, while we express the relative position of the two observatories (in longitude) by saying that Paris is 2° 20′ 24″ east of Greenwich, the French describe Greenwich as 2° 20′ 24″ west of Paris.

It is usual to measure terrestrial longitudes in time, the whole circuit of the globe being supposed described (as in the diurnal motion) in 24 hours. It is also usual to reckon longitudes to 180° east or west, without proceeding farther. Thus a motion in longitude of 185° east will bring the traveller into 175° of west longitude. In astronomical writings, however, longitudes (both geographical and celestial) are measured all round the globe.

Supposing the earth to be a sphere, the latitude of a place is the angle subtended at the centre by the arc of the meridian intercepted between the place and the equator. This angle is equal to the altitude of the pole of the heavens at the place: and the determination of the altitude of the pole is the method usually resorted to for determining the latitude. But the earth not being precisely a sphere, but a spheroid, the zenith line (which is a perpendicular to the tangent plane) does not pass exactly through the centre, and the altitude

of the pole is not precisely the angle subtended at the centre by the arc of the meridian. Still however the altitude of the pole is called the latitude of the place; and it must be distinctly understood that a latitude, astronomically determined, is the angle made by a line which is vertical at the place with its projection on the equator.

The reason why the preceding is not of more importance in the construction of maps lies in this, that, when a large portion of the earth is mapped, the scale is necessarily too small to make such an error of any consequence; and, when a small portion of the earth is taken, the error is nearly the same in every part of the map, and relative positions are not sensibly affected.

The history of the method of finding the longitude divides itself into two portions. The first, or the account of the real progress of the problem, is so mixed up with the history of astronomy and horology, that it would be useless to attempt it within any limits which we could afford: the second is that of the speculators who have misunderstood the problem, and is not worth the recital. Since however there are still persons who imagine that some mysterious method is yet attainable, by which the longitude is to be found, and since the conductors of the newspaper press are not all sufficiently aware of the state of the problem to prevent the insertion from time to time of paragraphs which create a most erroneous impression, we shall briefly point out the source of the fallacy which has misled so many persons.

The determination of the longitude requires simply accurate instruments for the measurement of the positions of the heavenly bodies, and one or other of the two following—either perfectly correct watches, or perfectly accurate tables of the lunar motions. The legislature of Queen Anne, which passed an act offering a reward for the discovery of the longitude, the problem being then very inaccurately solved for want of one or the other, good watches or lunar tables, never contemplated the invention of a method, but only of the means of making existing methods sufficiently accurate. And the legislature of George III., which repealed the former act and substituted another, specifically limited the reward to those who should either proceed by improvement of chronometers, or of lunar tables. The rewards which were given were to Harrison for the former, and to Mayer's executors for the latter. The latter act is now repealed, and there does not exist any parliamentary offer of a sum of money for further improvements.

Many persons, imagining that, as in the case of the quadrature of the circle, &c., a theoretical difficulty existed, have employed themselves in endeavouring to invent a method, imagining that they should obtain the prize held out by the legislature. Some persons still occupy themselves in this manner; and it is impossible to persuade them either of the repeal of the acts of parliament, or of their having mistaken the nature of the difficulty, which is now, for all practical purposes, entirely conquered. It is impossible to find the latitude of a place without knowing the position of the equator in the heavens, or the longitude without knowing the meridian of Greenwich. The equator has a real existence in the heavens, since its pole is the immoveable point of the heavens, which can be detected (though it is not absolutely occupied by a star) from observation of the motion of the stars, which always preserve their distance from the pole. But the meridian of Greenwich, a purely arbitrary circle of the earth, determined merely by the will of Charles II. that an observatory should be built on a certain hill near London, has no representative in the heavens. The only method, then, of finding longitude from the heavenly bodies is by finding the hour of the day which it is at Greenwich, at a particular hour on the spot whose longitude is required. It is then known how much of 360 degrees is revolved through by the earth in the period which brings a star from the meridian of the place upon the meridian of Greenwich, or *vice versâ:* and this angle is the longitude. A watch which goes correctly and is set at Greenwich will carry the time at that place all over the world; or a celestial phenomenon, of which the Greenwich time may be predicted, will, if the moment of its happening be observed at any other place, give the difference of times at the moment of observation. Any proposal for finding the longitude *astronomically,* which does not depend on one or the other of these principles, is useless, unless it be that of actually measuring the distance between the given place and Greenwich, the latitudes of both being known. Whether it be possible to use any other than astronomical means for the purpose, it would be presumptuous to decide; but there certainly is no other method which offers the most distant prospect of success.

LONGLAND, or LANGELANDE, ROBERT, the reputed author of the 'Visions of Piers Plowman.' He was a secular priest, born at Mortimer's Cleobury in Shropshire, and was afterwards fellow of Oriel College in Oxford. He lived in the reigns of Edward III. and Richard II. Longland, according to Bale, completed the 'Visions' in 1369.

LONGOBARDS, LONGOBARDI, or LANGOBARDI, *Long-Beards,* a nation of ancient Germany, mentioned by Tacitus ('German.,' 40) as a tribe of the Suevi. They lived east of the Elbe, towards the shores of the Baltic Sea. The Longobards joined Arminius against Maroboduus, king of the Suevi. (Tacit. 'Annal.,' ii. 46.)

During the 3rd and 4th centuries of our æra the Longobards came to the banks of the Danube, where they became allies of Odoacer, king of Italy. The Longobards afterwards almost exterminated the Heruli; and about the middle of the 6th century they occupied part of Pannonia, under their king Audoin. Here they came in contact with the Gepidæ, a nation settled in Dacia, on the borders of the Eastern empire, and which the Longobards, with the assistance of the Avari, totally defeated.

In the year 563 Alboin crossed the Julian Alps, near Forum Julii, and led the Longobards to the conquest of the plains of North Italy, which have ever since been called by the name of the conquerors. [LOMBARDY.] Pavia became the capital of the Longobards. Shortly after the death of Alboin,

A.D. 573, the nation became divided among a number of dukes, a duke of Ticino or Pavia, a duke of Friuli, a duke of Trento, a duke of Bergamo, a duke of Brescia, besides thirty dukes in as many other cities. Under these dukes the Longobards penetrated south of the Apennines, and conquered Tuscany, Liguria, Umbria, and part of Campania. The Byzantine emperors retained Ravenna, Rome, and its duchy, Padua, Genoa, Apulia, Calabria, Naples, and the southern extremity of Italy, with Sicily. After ten years of this disorderly dominion of the dukes, the Longobards chose for their king Autaris, son of Clefo, 586-592. After the death of Autaris, his widow Theodolinda married Agilulfus, duke of Turin, who was acknowledged by the Longobards as their king. Agilulfus, through the persuasion of his wife, became a Catholic, most of his countrymen being Arians, and made peace with Gregory the Great, bishop of Rome. Theodolinda built the church and palace of Monza, where was deposited the iron crown (so called from a nail, said to be from the cross of our Saviour, which is riveted inside of the crown), which has served ever since for the coronation of the kings of Lombardy. Agilulfus died in 615, and was succeeded by his son Adaloaldus, under the regency of Theodolinda.

Rothar, son-in-law of Agilulfus, was the first king who made a compilation of the unwritten laws and usages of the Longobards, and published them in a kind of barbarous Latin, under the name of Edict, with his own preface and observations. This edict drew a marked distinction between the Longobards and the Roman or subject population, which continued to live under the Roman law. The Roman or Italian subjects of the Longobards were looked upon as a conquered and subject race: they had neither the same political nor civil rights as the conquerors; they had no voice in their assemblies; they had no appeal against the caprice of their Longobard rulers; they lived among themselves according to the Roman law, but in any affairs between them and the Longobards they were judged by Longobard judges and according to the Longobard law.

Liutprandus, who became king A.D. 713, and reigned thirty-two years, was the most illustrious of the Longobard kings. 'He was,' says Warnefrid, 'valiant in war, but fond of peace; of forgiving disposition; although destitute of learning, like most of his countrymen, yet gifted with judgment and perspicacity, and worthy of being compared with philosophers; careful of the welfare of his people, and a legislator.' Astolphus took Ravenna in 751, and put an end to the dominion of the Exarchs. [ASTOLPHUS.] Astolphus died in 756, and Desiderius, a Longobard duke, was elected his successor. Charlemagne came into Italy A.D. 774, defeated Desiderius, and carried him prisoner into France, where he became a monk. The kingdom of the Longobards ended with Desiderius, and the Longobard nation and its territories became subject to Charlemagne.

LONGTOWN. [CUMBERLAND.]

LONGUE'. [MAINE-ET-LOIRE.]

LONGUS is the name of the author of a Greek pastoral romance, 'The Loves of Daphnis and Chloe,' or, according to the literal version of the Greek title, 'Pastoral Matters concerning Daphnis and Chloe,' which has been generally admired for its elegance and simplicity, and is one of the earliest specimens of that kind of composition. The author is supposed to have lived in the 4th or 5th century of our æra. One of the latest editions of Longus is by P. L. Courier, 1810, of which only fifty-two copies were printed. There is an edition by Seiler, 1835. Courier republished Amyot's French translation of Longus, adding to it the translation of a passage which he discovered in the Florentine manuscript.

LONGWY. [MOSELLE.]

LONICE'RA, a genus of plants, the type of the natural order *Caprifoliaceæ*. There are about 60 species of Lonicera, most of which have handsome flowers and emit a delicious perfume. *L. caprifolium*, Goatsleaf, has a twining stem, with white or purplish flowers and orange-coloured berries. It is a native of the middle and south of Europe, and is found in woods and thickets in many parts of England and the south of Scotland. *L. periclymenum*, the Woodbine, or Honeysuckle, has climbing branches, flowers of a pale yellow, berries red, and accompanied with permanent bracts. This plant in early times was supposed to possess powerful medicinal properties, but it is not now used. It is however extensively cultivated in the gardens and shrubberies of Europe on account of the delicious perfume of its flowers. It is a native of middle Europe, and very abundant in some parts of Great Britain. *L. xylosteum*, Fly Honeysuckle, is a native of nearly the whole of Europe, in thickets, hedges, and rocky places, and by the side of woods. It is found in the same situations, but is a rare plant, in Great Britain. *L. Tartarica*, the Tartarian Honeysuckle, is a native of Tartary, and is one of the most hardy of European shrubs, growing in the open air in the gardens of St. Petersburg and Stockholm. It is very common in British gardens, and is valued much on account of its early leafing and flowering.

All the species of Lonicera are well adapted for gardens, shrubberies, &c.

LONS-LE-SAULNIER. [JURA.]

LOO-CHOO ISLANDS. [LIEU-KIEOU ISLANDS.]

LOOE, EAST and WEST. [CORNWALL.]

LOOM. [WEAVING.]

LOPE DE VEGA. [VEGA.]

LO'PHIADÆ, a family of fishes of the acanthopterygious order, and forming the *Pectorales Pediculées* of Cuvier. In this family the pectoral fins are so constructed and placed as to perform the office of feet. The skeleton is subcartilaginous. Under this head four genera are included, viz. *Lophius* (Cuv.), *Antennarius* (Comm.), *Malthe* (Cuv.), and *Batrachus* (Block). (Cuvier's 'Règne Animal,' vol. ii. p. 249.) As a typical example of this family we may adduce the Fishing-Frog, Angler, or Sea-Devil, *Lophius piscatorius* (Linn.), of which an excellent account, with figures, is given in Yarrell's 'History of British Fishes,' vol. i.

LOPHIOBRANCHII, a family of fishes in which the gills, instead of being pectinated, are

separated into small rounded tufts, which are arranged in pairs along the branchial arches, and covered by a large operculum, so fixed as to leave only a single small orifice for the passage of the water outwards. The Pipe-Fishes, *Syngnathus*, *Hippocampus*; *Solenostomus*, and *Pegasus*, are the genera included in this family.

LO'PHIODON, an extinct genus of mammiferous quadrupeds, placed by Cuvier between *Palæotherium* and the *Tapirs*. M. de Blainville named the genus *Tapirotherium*.

Lophiodon differs from *Palæotherium* in the characters of the lower molar teeth, which, instead of exhibiting a continuous series of double crescents running longitudinally, are distinguished by transversal elevations, more or less oblique.

Incisors, $\frac{6}{6}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{7-7}{6-6}=42$.

About fifteen species are known, belonging to the great fresh-water formation of the Eocene period of Lyell.

LORANTHA'CEÆ, a natural order of Exogens, referred by most systematical writers to either the polypetalous or monopetalous sub-class, but by others regarded as more closely in alliance with the apetalous *Santalaceæ* and *Proteaceæ*. They are in nearly all cases true parasites, growing upon the branches of trees, below whose bark they insert their roots, incorporating them with the wood, and feeding upon the vital juices of the plants which they attack.

There is but one species, the common Mistletoe, *Viscum album*, found wild in England. A species of *Loranthus* occurs in the south of Europe; but in the hot dry parts of tropical countries the species abound, swarming over the branches of trees, of which they often form a conspicuous feature, with their long-clustered gaily coloured flowers. As in this country the mistletoe does not injure in any considerable degree the plant which it attacks, unless it exists in unusual quantity, so in India, where *Loranthi* are common, the injury sustained by vegetation is according to the reciprocal size of the parasite and its stock.

LORANTHUS, a genus of plants, the type of the natural order *Loranthaceæ*. The species are evergreen shrubs parasitical on trees. *L. Europæus*, the European Loranthus, is an evergreen parasitical plant, and has the habit of the common mistletoe. It is a native of the southern parts of Europe, and is found on the oak, but inhabits no other tree.

LORCA. [Murcia.]

LORD-LIEUTENANT. The authorities and duties of the lord-lieutenant and of his temporary vice-lieutenants, and of his permanent deputy-lieutenants, have latterly been fixed and regulated by the militia acts. [Militia.]

LORD OF MISRULE, the *Master of the Revels*. 'First in the feast of Christmas,' says Stowe ('Survey of London,' edit. 1603, p. 98), 'there was in the king's house, wheresoever he was lodged, a Lord of Misrule, or master of merry disports, and the like had ye in the house of every nobleman of honour or good worship, were he spiritual or temporal: amongst the which the mayor of London, and either of the sheriffs, had their several Lords of Misrule, ever contending, without quarrel or offence, who should make the rarest pastimes to delight the beholders. These lords, beginning their rule on Allhallow-Eve, continued the same till the morrow after the Feast of the Purification, commonly called Candlemas Day.'

LORDS, HOUSE OF. [Parliament.]

LORDS JUSTICES. [Justices, Lords.]

LORDSHIP. [Leet.]

LORENZO, or LORENZETTO, AMBROGIO and PIETRO DI, were born at Siena about 1300. They were brothers. Some of the works of these painters still remain, though the principal of their works, by Ambrogio, which is described by Ghiberti (in 'Cod. Magliabecchiana,' f. 8 & 9), is destroyed. It was painted in the Minorite convent at Siena, and represented the fatal adventures of some missionary monks. In the Sala delle Balestre, Siena, there is a tempera painting of Peace by Ambrogio; and in the Stanza del Pilone, a room against the sacristy of the cathedral of that city, there is one by Pietro, representing some passages from the life of John the Baptist.

LORE'TO. [Macerata.]

LO'RIENT, a seaport at the confluence of the Scorf and the Blavet, in the French department of Morbihan, is situated in 47° 44′ 45″ N. lat., 3° 21′ 30″ W. long., at a distance of 267 miles W. by S. from Paris, and has 23,621 inhabitants.

The town is of modern origin. In 1666 Louis XIV. granted permission to the French India Company to establish magazines and docks for building vessels on a part of the Bay of St.-Louis, the name given to the mouth of the Blavet. The establishment thus formed, which continued long in the possession of the company (long since dissolved), now belongs to the government. From the company's establishment the place took the title of Port de l'Orient (Port of the East). In 1720 the building of the town was commenced: in 1738 the inhabitants amounted to 14,000, in which year the town was incorporated. The India Company had previously established here their annual sale of Chinese and India commodities. In 1744 the town was fortified.

Lorient is well laid out, with wide, straight, well-paved and clean streets: the houses are well built, and there are several pleasant promenades. The bridge over the Scorf, the quays, the theatre, the abattoir, and the covered meat and fish markets are the public buildings most entitled to notice. The port is on the east side of the town, from which it is walled off: its length is nearly 4000 feet; its breadth is nearly 2000 feet. The royal dockyard is one of the finest in the kingdom; there are slips for laying down thirty vessels of war at a time. Among the most remarkable objects connected with the dockyard are the machinery for fixing the masts; the basin for ships under repair; the manufactory for steam machinery; the block manufactory, worked by steam; the arsenal; the artillery barracks; the school of naval artillery, with its library, museums, and drawing-hall; the apartments and gardens of the maritime prefect; and the offices of the various departments of the public service. There is a signal-

tower 123 feet high, built on an eminence S. of the harbour, from which vessels can be discerned 30 miles out at sea. Lorient has manufactures of hats, linens, braid, and pottery; the exports consist of corn, wine, brandy, iron, lead, cotton and woollen stuffs, hardware, &c., cattle, and manufactured goods. The sardine fishery is actively carried on.

Lorient is the seat of a maritime prefect, of tribunals of first instance and of commerce; it has also a chamber of commerce, an exchange, a college, and a custom-house.

LORIOL. [DRÔME.]

LORNE. [ARGYLESHIRE.]

LOROUX. [LOIRE, INFÉRIEURE.]

LORRAINE, a large province of France, which now forms the departments of VOSGES, MEURTHE, MOSELLE, and MEUSE, was bounded N. by Germany, E. by Alsace, S. by Franche-Comté, and W. by Champagne. It was about 99 miles long, and 87 broad, and was drained by the navigable rivers Meurthe, Meuse, Moselle, and Sarre, and their feeders. After having formed part of Gallia Belgica under the Romans, and of Austrasia under the successors of Clovis, the territory of Lorraine was united to the empire of Charlemagne. It was afterwards erected into a duchy, and in course of time passed to the house of Austria. By the treaty of Vienna, concluded Nov. 18, 1736, Francis Stephen, duke of Lorraine and husband of Maria Theresa, exchanged for the duchy of Tuscany the duchies of Lorraine and Bar, which were ceded to Stanislas Leczinski, the father-in-law of Louis XI., during his life. Stanislas having died Feb. 3, 1766, the two duchies were reunited to France.

Lorraine included the duchy of Lorraine, the duchy of Bar, and the Pays-des-Trois-Évêchés, which had Nancy, Bar-le-Duc, and Metz, for their respective capitals.

LORRAINE, CARDINAL DE. [GUISE.]

LORY. [PSITTACIDÆ.]

LOSTWITHIEL. [CORNWALL.]

LOT, a department in France, formed out of the old district of Quercy and lying between 44° 13′ and 45° 3′ N. lat., 1° 1′ and 2° 14′ E. long., is bounded N. by the department of Corrèze, E. by those of Cantal and Aveyron, S. by that of Tarn-et-Garonne, and W. by those of Lot-et-Garonne and Dordogne. Its greatest length from N.E. to S.W. is 65 miles, and its average breadth is 35 miles. The area is 2028 square miles, and the population in 1846 was 294,566, which gives 145.249 to the square mile, being 28.5 under the average per square mile for all France.

The department takes its name from the *Lot*, a river which, rising in the Margeride Mountains, in the department of Lozère, flows in a general western direction across the departments of Lozère, Aveyron, Lot, and Lot-et-Garonne, where it enters the Garonne on the right bank a little above Aiguillon, after a course of 270 miles, 187 of which, from Entraigues, where it is joined by the Truyère, in the department of Aveyron, are navigable. The north of the department is drained by the DORDOGNE. The watershed between these two rivers is formed by a prolongation of the Auvergne Mountains, which traverse the department from N.E. to W., dividing it into two slopes, the northern one belonging to the basin of the Dordogne, the southern one to the basin of the Garonne. The *Selle*, which flows along the south-eastern side of this mountain range, and enters the Lot on the right bank near St. Cirq, is the only other river of importance. Some small feeders of the Garonne rise in the south of the department, the largest of which is the Barguelonne. The eastern districts of the department are covered with low hills which are ramifications of the Cévennes.

The deep soils of the valleys and plains yield fine crops of wheat, maize, barley and oats; on the lighter soils, rye, rape, and buckwheat are grown; and on the strongest soils considerable quantities of hemp and tobacco are raised. The hill-slopes along the rivers are generally laid out in vineyards, which yield annually 13,200,000 gallons of wine, the best kinds being those of Cahors and Grand-Constant. About two-thirds of the whole produced is exported or distilled into brandy. The white mulberry is extensively cultivated for the production of silk. Excellent truffles are found. Plums are grown in large quantities, and, when dried, form an important article of export. Turkeys, geese, game, and poultry generally, are very plentiful. Horses, cows, and sheep are of inferior breeds; goats are numerous; and large numbers of pigs are fatted for the supply of the neighbouring departments. Wild boars are now rarely met with. Hares and rabbits are very numerous, and of large size. Fish is abundant in all the rivers, among which the Cère, a feeder of the Dordogne, is famous for eels, and the Lot for carp of enormous size.

The department presents great differences of temperature and climate. Among the granitic highlands of the east, the winters are long and rude, generally lasting from November to April, during which time snow and rain, each accompanied by cold winds, alternately succeed each other. The calcareous slopes of the Auvergne range have a drier and less rigorous climate, and a much shorter winter. In the plains and the valleys of Dordogne and the Lot, the climate is genial, except during the spring, when the night-frosts are often very harsh and biting.

Some iron and coal mines are worked; lead, calamine, marble, millstone-grit, granite, limestone, potters' and fullers' earth, &c., are found.

Of manufacturing activity there is little; a little bar and cast iron, coarse cotton and woollen stuffs, brandy, and paper, are made. The corn-mills, which are 922 in number, are the only important manufacturing establishments in the department. The commerce is composed of the articles already indicated, and of hides, salt, oak-staves, groceries, small wares, broad cloth, &c. About 680 fairs are held in the year. Roadway accommodation is afforded by 4 royal, 11 departmental, and 37 parish roads.

The department contains 1,298,042 acres, distributed among 107,886 proprietors, and into 1,198,226 parcels. Of the whole area, 574,622 acres are under tillage; 62,483 consist of grass

land; 144,876 are under vines; 215,620 are covered with woods and forests; 176,153 with heaths and moors; and 80,520 are occupied with orchards, plantations, and nurseries.

The department is divided into 3 arrondissements, which, with their subdivisions and population, are as follows :—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Cahors . . .	12	100	118,816
Figeac . . .	8	116	92,964
Gourdon . .	9	103	82,786
Total . .	29	319	294,566

Of the arrondissement of Cahors, and of the whole department, CAHORS is the capital. *Castelnau-de-Montratier* occupies the summit of a steep hill, 14 miles S. from Cahors, and has 4133 inhabitants. Its position, its ramparts and strong castle, of which there are still some vestiges, rendered it formerly a town of considerable importance. *Moncuq*, situated on a conical hill between two valleys, 14 miles S.W. from Cahors, has 2314 inhabitants. It was formerly one of the most important fortresses of Quercy; in accordance with the treaty of Meaux, its formidable defences were demolished, with the exception of a single square tower 109 feet high, which still stands in the highest part of the town. *Puy-l'Evêque* is situated on a peninsula formed by the Lot, on its right bank, 15 miles W. by N. from Cahors, and has 2505 inhabitants.

In the arrondissement of Figeac, the chief town, *Figeac*, is situated in a pretty valley surrounded by hills, which are covered with woods, vineyards, and orchards, on the right bank of the Selle, 32 miles N.E. from Cahors, and has a tribunal of first instance, a college, and 6171 inhabitants. This town was formerly surrounded by ramparts and ditches, part of which still remain. The streets are narrow and ill laid out; the houses ill built, many of them remarkable for antiquity of style. The most important buildings are the Château-de-Baleine, a part of the old fortifications of which now serves for a court-house; the abbey church of St.-Sauveur; and the church of Notre-Dame-du-Puy. Two obelisks, called Aiguilles, one S., the other W. of the town, are remarkable for their structure and antiquity; they were used in former times as fire-beacons to guide travellers by night through the surrounding countries, which were then covered with dense forests. *Cajarc*, a town of 2055 inhabitants, is situated in a very fertile district, on the right bank of the Lot, 12 miles S.W. from Figeac. *St. Céré*, 18 miles N. by W. from Figeac, is built on an island formed by the Bave, a feeder of the Dordogne, and has 3902 inhabitants, who manufacture great quantities of hats. To the north of the town are the remains of a fortified camp, said to be Roman, in which however several ecclesiastical structures seem to have been erected; of these, two lofty isolated towers are still standing.

The arrondissement of Gourdon takes its name from its chief town, *Gourdon*, which is situated on a hill in the west of the department, 22 miles N. from Figeac, and has a tribunal of first instance, a college, and 5325 inhabitants, who manufacture woollen stuffs, linen, and hats. The town, which is tolerably well built, and has a handsome church, was formerly surrounded by strong ramparts. *Gramat*, situated in a romantic valley, 16 miles N.E. from Gourdon, on the right bank of the Alzon, a feeder of the Dordogne, has mineral springs, and 3560 inhabitants, who trade in corn and wool. *Martel*, 11 miles N. by W. from Gramat, has a college and 3070 inhabitants. It owes its origin and name to Charles Martel, who erected a church here, which was re-built on a large scale in the year 1300, and is lighted through stained-glass windows remarkable for beauty of colouring and correctness of design; the subjects represented are the principal incidents of our Saviour's passion. *Souillac*, a well-built town, with a tribunal of commerce and 3087 inhabitants, is situated in a fertile valley, 12 miles N. by E. from Gourdon, on the right bank of the Dordogne, which is here spanned by a stone bridge of 7 arches. Coarse woollens, agricultural implements, bar-iron, leather, and iron-ware are manufactured; there is also some trade in wine, tobacco, hides, salt, groceries, oak-staves, cattle, &c.

The department forms the see of the Bishop of Cahors; it is included in the jurisdiction of the Cour Royale of Agen and of the University Academy of Cahors, and belongs to the 10th Military Division, of which Toulouse is head-quarters. It formerly sent 5 members to the Chamber of Deputies; it now has 7 representatives in the National Assembly.

(*Dictionnaire de la France; Statistique de la France; Annuaire pour l'An* 1849.)

LOT-ET-GARONNE, a department in France, comprising the former district of Agénois, part of the diocese of Condom, and portions of those of Bazas, Lectoure, and Cahors, takes its name from the Lot and the Garonne, which traverse it, the former from N.E. to W., the latter from S.E. to N.W., and is bounded N. by the department of Dordogne, E. by those of Lot and Tarn-et-Garonne, S. by that of Gers, and W. by those of Landes and Gironde. Its greatest length from N.E. to S.W. is 63 miles, from S.E. to N.W. 55 miles. The area is 2048 square miles, and the population in 1846 was 346,260; which gives 169.07 to the square mile, or 4.68 below the average per square mile for all France.

The surface of the department presents a high plain, furrowed to different depths by river-valleys, but diversified in the south by some low swells, the last declivities of the Pyrenees northwards; the whole inclining towards the north-west and belonging to the basin of the Garonne. Nothing can exceed the beauty and fertility of the valleys of the Lot and the Garonne; the slopes that inclose them are covered with vines and other fruit trees, especially the fig and the plum, and the low lands yield abundantly wheat, maize, rye, hemp, tobacco, &c. The valley of the Baise, in the south, and that of the Dropt, in the north of the department, are also very fertile. With these exceptions, the department presents an arid, treeless

surface, with a barren stony soil, especially in the eastern districts at a little distance from the Lot and the Garonne. In the upper part of Agénois, the soil is a stiff iron-coloured clay that ill repays the labour of the husbandman; and in the Landes, which extend over the south-west of the department along the Avence, the ground is covered with arid sands, unhealthy marshes, and in some places with a scanty soil, which can with difficulty be made to produce a few ears of corn. In this last district there are also some hungry pastures and forests of pine and cork; the cork-woods along the left bank of the Gelise, a feeder of the Losse, in the south of the department, are the largest in France. On the northern borders there are fine chestnut woods. The quantity of wine annually produced is 14,014,000 gallons, half of which goes for the home consumption; part of the surplus is distilled into brandy, and the remainder is exported to Bordeaux. A considerable number of cattle, horses, mules, and sheep are reared. Immense numbers of geese also are reared, and form an important article of export. Game and fresh-water fish are plentiful. The climate of the department is in general very healthy; but long alternations of drought and rain are not uncommon.

The principal rivers are the LOT, the GARONNE, the Baise [GERS], the GERS, and the Dropt [DORDOGNE.] Roadway communication is afforded by 6 royal and 16 departmental roads.

Iron mines are worked; good building stone, calcareous spar, gypsum, and marl are found. The chief manufactures are cork, sailcloth, linen, swanskins, pottery, linen and cotton yarn, iron, glass, paper, lime, ropes, leather, tobacco. The commerce is composed of the various industrial and agricultural articles enumerated, and of pitch and tar made from the pines of the Landes. About 675 fairs are held annually. The department possesses 1138 wind and watermills, 9 iron forges and furnaces, and 239 factories of different kinds.

The department contains 1,311,463 acres, distributed among 122,965 proprietors, and into 1,401,104 parcels. Of this area 706,996 acres are arable land; 104,584 are grass land; 171,371 acres are under vineyards; 169,617 are covered with woods; 97,986 consist of barren heaths and moors; 28,752 acres are occupied with roads, buildings, &c.; 12,689 with rivers; and 19,020 are laid out in orchards and fruit plantations of various kinds.

The department is divided into 4 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Agen . . .	9	127	85,149
Marmande . .	9	111	103,012
Villeneuve-d'Agen . .	10	97	96,992
Nérac . . .	7	53	61,107
Total . .	35	388	346,260

In the arrondissement of Agen, the chief town, *Agen*, which is also the capital of the department, and of the former district of Agénois, is situated in a wide and rich plain, on the right bank of the Garonne, in 44° 12′ 27″ N. lat., 0° 37′ 50″ E. long., at a distance of 88 miles S.E. from Bordeaux, 377 S. from Paris, and has 14,987 inhabitants. The town, which existed under the name of *Aginnum* in Roman times, is ill built. The finest quarter is the suburb on the Bordeaux road, which runs along the right bank of the river, and terminates in the magnificent promenade of Gravier. This promenade, which communicates with the left bank of the Garonne, by a fine suspension bridge at one end, and by a stone bridge of 11 arches at the other, consists of an avenue formed by gigantic elms, that interlace their boughs high overhead, forming a continuous vault of living verdure, all but impenetrable to the rays of the sun; while on either hand their trunks and side branches are fashioned into elegant arcades. The principal buildings in Agen are—the cathedral church of St.-Caprais; the church of the Jacobins, the former episcopal palace, now the residence of the prefect; the ecclesiastical college; and the public library, which contains 15,000 volumes. From a rocky height near the town, called l'Ermitage, there is a magnificent view over the rich valley of the Garonne, with the Pyrenees in the distance. In a recess on the slope of l'Ermitage is shown the house of the Scaligers, the younger of whom was born here. Agen gives title to a bishop; it is the seat of the Cour Royale for the departments of Lot, Lot-et-Garonne, and Gers, and has tribunals of first instance and of commerce, a normal school, two schools for the education of the clergy, and a communal college. The manufactures consist of sailcloth, linen, serge, swanskins, printed cottons, brandy, leather, &c.; the commerce in corn, flour, wine, brandy, plums, woollen cloth, cotton yarn, feathers, &c., is considerable. Steamboats ply regularly between Agen and Bordeaux. *Astaffort*, on the right bank of the Gers, 10 miles S. from Agen, is said to have been built by the English and named *Stafford*. It is surrounded by old turreted half-ruined walls, and has 2414 inhabitants. A large cross marks the spot, still called *Champ des Huguenots*, on which the Prince of Condé was defeated in the religious wars. *Port-Sainte-Marie*, 12 miles W. from Agen, is built at the foot of a high hill, on the right bank of the Garonne, which is here crossed by a fine suspension bridge and forms a commodious harbour for river craft. The high road to Bordeaux passes under an arcade surmounted by a lofty tower, the whole built with small square stones, and supposed to be of Roman erection. The population of the town is 3025.

In the arrondissement of Marmande, the chief town, *Marmande*, is situated in the west of the department, on a hill above the Garonne, which is here crossed by a bridge of a single arch. The town has an old-fashioned look; many of the houses are timber-framed. The most important buildings are the town-hall, the court-house, the college, and the hospital. Marmande is the seat of a tribunal of first instance, and has 7805 inhabitants, who manufacture hats, woollen stuffs, brandy, ropes, and leather. It has also a con-

siderable trade in corn, flour, wine, brandy, plums, hemp, tobacco, &c. Steam-boats ply several times a day to Bordeaux. *Clairac*, a clean well-built town, stands in a pretty situation on the right bank of the Lot, has 4842 inhabitants, who trade in white wine, plums, flour, tobacco, &c. *Castel-Moron*, formerly a fortified town, which was held more than a century by the English, stands on the Lot, and has 2379 inhabitants. *Le-Mas-d'Agénois*, a small but ancient town, stands 8 miles from Marmande, on the left bank of the Garonne, and has 2414 inhabitants. *Tonneins*, a few miles E. of Le-Mas-d'Agénois, on the right bank of the Garonne, which is here crossed by a suspension bridge, is a cheerful, well-built town, situated on the sides of a hill, from whence there is a delightful view. The town-hall, the theatre, and the public baths are the most conspicuous buildings. Tonneins has a population of 6973, who manufacture great quantities of ropes, leather, and tobacco, and trade in these articles, as also in hemp, plums, wine, corn, and brandy, &c.

The arrondissement of Villeneuve-dAgen takes its name from *Villeneuve*, a town of 12,337 inhabitants, 14 miles N. from Agen, situated on the Lot, which divides it into two unequal parts, united by an ancient bridge of remarkable structure. By much the greater part of the town is on the north bank of the river, and consists of several wide, straight, well-built streets, that abut in a circus surrounded by arcades. Of the old fortifications, two towers and the castle still remain; the ramparts have been turned into handsome promenades. The buildings of the ancient abbey of Eysse, situated about $\frac{3}{4}$ of a mile N. of the town, now form a convict prison for 11 departments. Villeneuve has tribunals of first instance and of commerce, and a college. Linen, leather, tiles, hammers for metal foundries, &c., are manufactured; the commerce is composed of flour, plums, wine, cattle, paper, iron, copper, &c. *Fumel*, E. by N. from Villeneuve, on the right bank of the Lot, has paper-mills, and 2577 inhabitants. *Sainte-Livrade*, W. of Villeneuve, and near the left bank of the Lot, has a population of 3209, who manufacture leather, and trade largely in plums. *Monflanquin*, situated on a hill, near the left bank of the Lède, 9 miles N. from Villeneuve, has 5075 inhabitants. The streets are narrow, steep, and ill paved. The neighbourhood is fertile in wine and fruits. *Tournon*, a market-town, 16 miles E. from Villeneuve, situated on a hill on the right bank of the Baudusson, a feeder of the Lot, has 4986 inhabitants.

The arrondissement of Nérac comprises the south-west of the department, and takes its name from the chief town, *Nérac*, which is prettily situated on the Baise, 15 miles S.W. from Agen, and has tribunals of first instance and of commerce, a college, and 7058 inhabitants, who manufacture coarse woollens, sea biscuits, corks, leather, and great quantities of flour. The old town, situated on a steep slope, on the right bank of the Baise, is ill built, with narrow streets of old wooden houses; it is joined by two stone bridges to the new town, which stands on the left bank, and is larger and better built. This town has several pretty and shady walks, one of which is adorned with a statue of Henri IV. The mosaics, the remains of a palace, a temple, an aqueduct, and of baths, found here, mark the place as the site of a Roman city, the name of which is lost. The town trades in linen, hemp, flax, wine, brandy, &c., and is famous for its partridge patties. Nérac has an important corn market. *Castel-Jaloux*, 18 miles N.W. from Nérac, on the left bank of the Avance, is a pretty and well-built town, not far from the commencement of the *landes*, and has 2585 inhabitants, who manufacture coarse cloth, paper, glass, leather, &c. It has also iron forges, copper foundries, smelting furnaces, hydraulic sawmills, and a considerable trade in corn, wine, pitch, and tar, oak-bark, chestnuts, and leeches. *Mézin*, 7 miles S. from Nérac, on the right bank of the Gelise, a feeder of the Baise, is an ill-built town, with 3042 inhabitants, who manufacture corks, pottery, flour, paper, and leather.

The department forms the see of the Bishop of Agen, is included in the jurisdiction of the Cour Royale of Agen, and of the University Academy of Cahors, and belongs to the 11th Military Division, of which Bordeaux is head-quarters. It returned 5 members to the Chamber of Deputies; it now has 9 representatives in the National Assembly.)

(*Dictionnaire de la France; Annuaire pour l'An* 1849.

LOTHIANS is a term under which that part of Scotland is comprehended which stretches along the southern shores of the Frith of Forth, and includes the three counties of Haddington, Edinburgh, and Linlithgow. The first of these counties is also called East Lothian, the second Mid Lothian, and the last West Lothian. This region lies between 56° 40′ and 56° 5′ N. lat., and between 2° 24′ and 3° 50′ W. long.

LOTIONS, or washes, termed also epithems, and, when intended for the eye, collyria, or eye-washes, are either mixtures of different ingredients, or solutions of various medicinal substances, in water or other menstrua, designed for external application. Many of the nostrums sold under the name of lotions are solutions of very active ingredients, and their application is often productive of very serious effects.

LOTTERIES have been encouraged by some states for the purpose of raising a revenue. The general plan has been for the government to sell a certain number of tickets or chances, and to distribute by lot a part of the money thus collected among a comparatively small number of the purchasers. Lotteries are games of chance, the aggregate number of players in which are sure to lose a part of their venture.

The earliest English lottery of which there is any record was in 1569, when 40,000 chances were sold at ten shillings each: the prizes consisted of articles of plate, and the profit was employed for the repair of certain harbours. In the course of the following century the spirit of gambling appears to have been materially increased in this direction, for *private* lotteries were, early in the reign of Queen Anne, suppressed 'as public nuisances.' In 1823, the last act that was

sanctioned by parliament for the sale of lottery tickets contained provisions for putting down all private lotteries, and for rendering illegal the sale, in this kingdom, of all tickets or shares of tickets in any foreign lottery, which latter provision is, to this day, extensively evaded.

The system of state lotteries was very long carried on by the French government, and was the cause of still greater demoralisation than in England. State lotteries have been abolished in France.

Lotteries have been very common in the United States, and have been sanctioned by the several states, not so much as a means of raising money for state purposes, as with the view of encouraging, as they supposed, many useful objects which could only be effected by raising at once a large sum of money, such as canals, the establishment of schools, and even the publication of a book. The numerous frauds practised in lottery schemes in the United States have perhaps done more to open the eyes of the people to the mischief resulting from them than any investigation into the true principles of lotteries. [Art-Unions.]

LOTTO, LORENZO, is supposed to have been one of the scholars of the Bellini, and also an imitator of Lionardo da Vinci. He lived long at Bergamo, and was generally considered a native of that place. He died at Loretto. His works range from 1513 to 1554. His masterpieces are the Madonnas of S. Bartolomeo, and Santo Spirito, at Bergamo.

LOTUS. The plant or plants referred to by classical authors under the name of Lotus are very numerous. Fée, the latest author ('Flore de Virgile'), enumerates no less than eleven. Of these some are herbaceous, others perennial. Among the former are the *Lotus sativa* and *L. sylvestris* of Dioscorides: the first, he states, is also called *trifolium;* it is supposed by some botanists to be *Melilotus officinalis*, and by others to be *M. cærulea*. Dr. Sibthorp has fixed upon *Melilotus messanensis* as the plant.

The *Lotus sylvestris* of Dioscorides, called also *Libyon*, a native of Libya, and about two feet high, with leaves like those of *Lotus trifolium*, and fruit like that of Fenugreek, is thought to be the *Trigonella elatior* of Sibthorp, which he found in Asia Minor and in Cyprus.

Lotus Ægyptia, or the Egyptian Lotus, is no doubt one of the *Nymphæaceæ*, being described as springing up in Egypt in fields inundated by the river, with a stem like that of the *κύαμος*, or Egyptian Bean (*Nelumbium speciosum*), and a white liliaceous flower, which rises out of the water at sunrise, and sinks down again at its setting, a capsule like that of the poppy, in which are contained seeds which the Egyptians roast and make into bread, with a root which is likewise eaten, both in a dressed and undressed state. The plant is no doubt the *Nymphæa Lotus* of botanists. But, as in the most ancient monuments a blue-coloured lotus is likewise represented, there is no doubt that the Egyptians were also acquainted with the *Nymphæa cærulea*.

The Egyptian lotus however is not so celebrated as another less known tree, to which exaggerated description has assigned a fruit of the most delicious kind, upon which the Lotophagi lived, and which, when strangers had once tasted, they ceased to wish to return to their native country. This is specially described as a tree, but there is no doubt that several have been confounded under this name. One of these plants has been described by both Dioscorides and Pliny. Polybius also describes another plant as the African Lotus. Dr. Shaw, in his 'Travels in Barbary,' figures a species of Zizyphus, which he calls 'Seedra Arabum, quæ et Lotus veterum.' It is a prickly branching shrub, with fruit of the size of a wild plum, and of a sweetish taste and saffron colour. He found it sold in the markets, cattle fed with it, and a liquor drawn from it. Desfontaines also found this *Zizyphus Lotus* on the same coast, and has fully described it. Mungo Park found a species of Zizyphus in the interior of Africa, which forms a large tree with yellow farinaceous berries of a delicious taste. The natives, he says, convert them into a sort of bread, by exposing them some days to the sun, and afterwards pounding them gently in a mortar, until the farinaceous part is separated from the stone. This meal is then mixed with a little water, and formed into cakes, which, when dried in the sun, resemble the sweetest gingerbread. It may be added, that the fruit of several species of Zizyphus is eaten in India.

LOUDE'AC. [Côtes-du-Nord.]

LOUDON, JOHN CLAUDIUS, was born at Cambuslang, in Lanarkshire, on the 8th of April, 1783. As a child Loudon exhibited a taste for gardening. When fourteen, he was placed with a nurseryman and landscape gardener. During this period he acquired the habit of sitting up two nights every week for the purpose of study,—a habit which he continued for many years.

In the year 1803 Loudon first came to London, and became a landscape gardener. One of his earliest literary efforts was made this year in the form of a paper contributed to the 'Literary Journal,' entitled 'Observations on laying out the Public Squares of London.' In 1804 he published his first work, entitled 'Observations on the Formation and Management of useful and ornamental Plantations.' In 1805 he published 'A short Treatise on some Improvements lately made in Hothouses.' In 1806 he published a 'Treatise on forming, improving, and managing Country Residences, and on the choice of situations appropriate to every class of Purchasers.' In 1822 appeared his great work, 'The Encyclopædia of Gardening.' A second edition was published in 1824. The success of this work led him to engage in the 'Encyclopædia of Agriculture,' published in 1825. Another work was edited by him, and published in 1829, with the title 'Encyclopædia of Plants.' This was followed by the 'Encyclopædia of Cottage, Farm, and Villa Architecture,' published in 1832. 'The labour,' says Mrs. Loudon, 'that attended this work was immense; and for several months he and I used to sit up the greater part of every night, never having more than four hours' sleep, and drinking strong coffee to keep ourselves awake.' He then planned his

'Arboretum et Fruticetum Britannicum.' This work was brought out in 1838. His first attack of rheumatic fever, in 1806, was so severe as to produce permanent anchylosis of his left knee. Subsequently his right arm became affected, and was amputated in 1826. In the meantime his left hand became affected so that he could only use the third and little finger. After this period he was obliged to employ for all his works both an amanuensis and a draughtsman. Early in 1843 he was attacked with chronic inflammation in his lungs, which terminated his existence on the 14th of December of that year. He continued working till the day of his death, and 'died standing on his feet.'

LOUDUN. [VIENNE.]

LOUGHBOROUGH. [LEICESTERSHIRE.]

LOUGHREA. [GALWAY.]

LOUHANS. [SAONE-ET-LOIRE.]

LOUIS I., called 'le Débonnaire,' and also 'the Pious,' son of Charlemagne, was made his father's colleague in the empire, A.D. 813, and after the death of Charlemagne, in the following year, he succeeded him as King of France and Emperor of the West. Bernard, son of Pepin, elder brother of Louis, having conspired to supplant his uncle in the empire, was seized by order of Louis, and his eyes were put out, in consequence of which he died in a few days. Louis showed great sorrow for this act of cruelty, to which he had been advised by his courtiers, and he did public penance for it before an assembly of bishops. In 820 Louis appointed his son Lotharius king of Italy and his colleague in the empire. To his son Louis he gave Bavaria, Bohemia, and Carinthia, and to his other son, Pepin, he gave Aquitania. The whole of this reign was a series of revolts and contentions between the emperor and his sons, partly caused by the conduct of the Empress Judith of Bavaria, a licentious and ambitious woman. In the midst of these troubles the emperor died, in June 840. Lotharius was acknowledged emperor, and, after a war against his brothers, he retained Italy, Provence, Burgundy, and Lorraine. Charles the Bald succeeded his father as King of France, and Louis of Bavaria had all Germany. The Emperor Louis was a weak prince. It was under his reign that the fiefs were first made transmissible by descent. He also allowed the popes elect to take possession of their charge without waiting for his confirmation.

LOUIS II., III., IV., and V. [FRANCE.]

LOUIS VI., called 'le Gros,' son of Philip I., succeeded his father in 1108. The larger part of the kingdom was then in the hands of the great vassals of the crown, over whom the king's supremacy was but nominal. The duchy of Normandy was in the possession of Henry I. of England. Henry and Louis quarrelled about the limits of their respective states, and thus began the wars between the English and the French in France, which lasted for more than three centuries. Louis had the worst in several encounters.

Assisted by his minister l'Abbé Suger, Louis succeeded in recovering for the crown some of the power which the great vassals had usurped, and he began the creation of the third estate, or commons, as a check on their power. Louis le Gros died at Paris in 1137, at the age of sixty. He was succeeded by his son Louis VII.

LOUIS VII. and VIII. [FRANCE.]

LOUIS IX., called St. Louis, succeeded his father Louis VIII. when he was twelve years of age, under the regency of his mother Blanche of Castile. During the minority of the king, there was a constant struggle between the crown and the great feudatories, in which the latter eventually triumphed. Louis then (1248) set out on a crusade to the Holy Land. He landed in Egypt, and took Damiat, but, being defeated at the battle of Mansoura, he was taken prisoner, compelled to pay a heavy ransom, and to restore Damiat to the Mussulmans. From Egypt he sailed to Acre, and carried on the war in Palestine, but with no success, till the year 1254, when he returned to France. He curbed the power of the nobles; published several useful statutes known by the title of 'Etablissemens de St. Louis;' established a police at Paris; classed the various trades into companies called confrairies; established the college of theology called La Sorbonne; created a French navy, and made an advantageous treaty with the King of Aragon, by which the respective limits and jurisdictions of the two states were defined. The chief and almost the only fault of Louis, which was that of his age, was his religious intolerance. A feeling of fanaticism led him to another crusade, in which he met his death. He sailed for Africa, laid siege to Tunis, and died in his camp, of the plague, in August 1270. Pope Boniface VIII. canonised him as a saint in 1297. Louis's brother Charles, Count of Anjou and Provence, took the kingdom of Naples from Manfred of Suabia, and established there the dynasty of Anjou. [ANJOU.]

LOUIS X. and XI. [FRANCE.]

LOUIS XII. succeeded Charles VIII in 1598. He carried on a long war in Italy against the Spaniards. He took possession of Milan, but was compelled to give it up, and also laid claim to the kingdom of Naples, in the prosecution of which he was assisted by Ferdinand of Spain. The result was that the French lost all power in Italy. His government at home was popular. During his reign the taxes were reduced by one half. He married Mary, sister of Henry VIII. of England. He died in 1515.

LOUIS XIII., son of Henri IV. and of Mary de' Medici, succeeded his father in 1610, being only nine years of age, under the regency of his mother. In October 1614, he was declared to be of age, and in the following year he married Anne, daughter of Philip III. of Spain. Concino Concini, maréchal d'Ancre, a Florentine, the favourite minister of the queen-dowager, had, by his insolence and his intrigues, excited considerable jealousy, and was killed at the instigation of the king. The parliament of Paris declared him to have been guilty of treason and sorcery; and on the same charges his wife was afterwards beheaded and her body burnt. The queen-dowager was sent to Blois under arrest. Luines, a young courtier, now became the ruling favourite; for Louis was totally incapable of governing himself

during the whole of his life. Some years after, the queen-dowager escaped from Blois, and, being supported by several nobles, a civil war broke out; but Armand du Plessis, bishop of Luçon, known afterwards as Cardinal de Richelieu, acted as mediator, in consequence of which he obtained a cardinal's hat, in 1624 became minister, and lastly prime minister, which he continued to be till his death in 1642. He checked the ambition of the house of Austria, and acquired for France considerable influence in the affairs of the Empire. In 1628 Richelieu took La Rochelle, the great stronghold of the Protestants of France. The French armies took an important and generally a successful part in the Thirty Years' War; they acted on the Rhine in concert with the Swedes, and, whilst another French army carried on the war in Italy against the Spaniards, a third army was fighting in Flanders, and a fourth on the frontiers of Catalonia. The great object of Richelieu was to render the government of the king absolute, and he succeeded. He at the same time patronised learning and the fine arts; he established the royal press, and embellished Paris. Louis died in May 1643.

LOUIS XIV. succeeded his father in 1643, being then hardly five years old. Cardinal Mazarin was the minister, under the regency of the queen mother. The treaties of Münster and Osnabrück (1648) put an end to the Thirty Years' War, and Mazarin concluded the peace of Westphalia. The same year however that the war in Germany was terminated, the civil war of La Fronde broke out in France. [FRONDE.] This war lasted with some intermissions till 1652, when Condé, one of the chief leaders of the Frondeurs, emigrated to join the Spaniards, and Cardinal de Retz, another of their supporters, was imprisoned. During the continuance of the war the court were twice obliged to leave Paris, and the consequence of a temporary reconciliation was the disgrace and exile of Mazarin in 1651, who however returned and resumed his ministry in 1653. In 1654 Louis XIV. made his first campaign in Flanders against the Spaniards. In the following year he concluded a treaty of alliance with Cromwell against Spain. The war continued that and the next year with various success; Turenne commanded the French troops, and the Prince of Condé fought on the side of the Spaniards against his own country.

In 1657 the Emperor Ferdinand III. died, and Mazarin intrigued, by means of bribery and promises, to prevent the election of his son Leopold, and to obtain the imperial dignity for Louis XIV. But he was unsuccessful: even those who had received his pay turned in favour of Leopold, who was unanimously elected in 1658. From that time began the bitter animosity of Louis against Leopold, which lasted half a century, and was the cause of three long and bloody wars.

Meantime the war with Spain was brought to a close, in November 1659, by Cardinal Mazarin, by the treaty of the Bidasoa, in which the marriage between the Infanta Maria Theresa, daughter of Philip IV. of Spain, and Louis XIV. was concluded. Spain gave up the Artois and Roussillon, and stipulated for a free pardon to the Prince of Condé.

The new queen was weak in her intellect, but harmless and good-natured. Louis XIV. always behaved to her with considerate regard, but never felt any affection towards her, and he resorted to the society of a succession of mistresses, of whom Mademoiselle de la Vallière, Madame de Montespan, and Madame de Maintenon are the most known. In February 1661, Mazarin concluded at Vincennes a third and last treaty with Charles, duke of Lorraine, by which Strasburg, Pfalsburg, Stenai, and other places were given up to France. Nine days after this treaty Mazarin expired, at fifty-nine years of age.

On the death of Mazarin Louis XIV. took the reins of government entirely into his own hands. He banished and imprisoned Fouquet, the minister of finance, on charges of peculation and treason. In appointing Colbert in his room, Louis made a good choice, and much of the splendour of his reign is due to that able minister. [COLBERT.]

Louis XIV. completed the work begun by Richelieu: he changed France from a feudal monarchy into an absolute one. After the death of Mazarin he admitted no more ecclesiastics into his council. The spirit of jealousy of the Gallican church made it less dependent on Rome, and more subservient to the crown. The parliaments were also subdued, like the nobility and clergy, by the absolute will of Louis, and offered little or no impediment to the royal authority.

Louis established that system of centralisation in the administration which has been followed and rendered more complete by the various succeeding governments, and which rendered France for a time the most compact power in Europe. His reign was a brilliant epoch of learning in France. With regard to the arts he had more pomp than taste.

Louis XIV. hated the Protestants, not so much from religious bigotry as because he considered them as rebellious subjects. This led him to that most unjust and disastrous measure, the revocation of the edict of Nantes, in 1685, by which Protestantism was proscribed in France, and by which that country lost thousands of its most industrious citizens. The persecution of the Jansenists was another consequence of Louis's intolerance.

The foreign wars of Louis XIV. proceeded in great measure from the same ruling principles or prejudices of his mind. He disliked the Dutch, whom he considered as mercantile plebeians, heretics, and republicans.

The first war of Louis XIV. against the Emperor Leopold, Holland, and Spain, was ended by the treaty of Nymegen, 1678. Louis kept the Franche Comté and part of the Spanish Netherlands. The war broke out again in 1689, between Louis on one side, and the Empire, Holland, and England, on the other. In Germany Louis XIV. caused one of the most atrocious acts recorded in the history of modern warfare. This was no less than the devastation of the Palatinate by his commanders. A district of more than thirty English miles in length, with the towns of Heidel-

berg, Mannheim, Speyer, Oppenheim, Creutznach, Frankenthal, Ingelheim, Bacharach, Sinzheim, and others, was ravaged, plundered, and burnt, in cold blood, under the pretence of forming a barrier between the French army and its enemies. A cry of indignation resounded throughout all Europe at the disastrous news. The treaty of Ryswick, in 1697, terminated the war, by which Louis gained nothing, acknowledged William III. as king of Great Britain, and restored the Duke of Lorraine to his dominions.

The third war of Louis was that of the Spanish succession. It began in 1701, and lasted 13 years, convulsed all Europe, and was terminated at last by the peace of Utrecht in 1713. Louis succeeded in establishing a Bourbon dynasty in Spain, but this was the only advantage he gained. He died Sept. 1, 1715, 77 years of age.

LOUIS XV., born in February 1710, was the only surviving son of the Duke de Bourgogne, eldest son of Louis the Dauphin, son of Louis XIV. The Dauphin died in 1711, and his son the Duke of Bourgogne in 1712. The mother of Louis XV. was Maria Adelaide of Savoy, who died in 1712. Philippe d'Orléans, son of Philippe de France, brother of Louis XIV., and the head of the actual Orléans branch of the Bourbons, was appointed regent. He had acquired an unfavourable reputation as a man of licentious habits, and as destitute of religious and moral principles. But he began well: he reformed several of the most outrageous abuses of the late reign, he liberated a number of individuals who had been for years immured in the Bastille, he enforced economy, reduced the army, supported the general peace of Europe, courted the friendship of England, concluded the triple alliance of the Hague in 1717, between France, England, and Holland, and gave up altogether the cause of the Pretender. Unfortunately, the depressed state in which he found the finances made him listen to the wild schemes of Law, which ended in disappointment and the ruin of thousands of families. [Law, John.]

The discovery of a conspiracy, encouraged by Philip of Spain against the Regent, led to a war with that country. But peace was concluded in 1720. In 1722 Dubois, who had been made a cardinal, became prime minister of France.

In February 1723, Louis XV., having completed his fourteenth year, was declared of age, and the regency of the Duke of Orléans terminated. Dubois died the same year, and the Duke of Orléans a few months after. The Duke of Bourbon Condé was made prime minister, and governed France until 1726. Louis married, in 1725, Maria Leczinska, daughter of Stanislaus, ex-king of Poland, and in the following year the Duke of Bourbon was dismissed from the ministry, and the Abbé de Fleury substituted for him. The seventeen years of Fleury's administration, which ended with his death in 1743, were the best period of this reign. Fleury restored order in the finances, and credit and commerce revived. In 1733 the war of the Polish succession broke out, by the death of King Augustus II., when Louis XV. took the part of his father-in-law Stanislaus, the old rival of Augustus, against Austria and Russia, who supported the son of Augustus. [Augustus III.]

The war was carried on between France and Austria both on the Rhine and in Italy. France gained great success in this war; but that of the Austrian succession, which broke out in 1741, involved her in ruinous expenses to no purpose. In the war with the English in America, which arose out of the Seven Years' War, France was equally unfortunate. By the peace of Paris, Feb. 1763, France formally ceded Canada, Nova Scotia, and her other North American colonies, besides Granada, Dominica, and Tobago, in the West Indies; its navy never after recovered from its losses, its finances were exhausted, and its commerce destroyed. The king had now abandoned himself to gross licentiousness, and had become careless of state affairs. The mad attempt of Damiens made him still more alienated from his people. [Damiens.] After the death of his mistress, the Marchioness of Pompadour, he became attached to more vulgar women [Barry, Marie Jeanne], and at last formed a regular harem after the fashion of the Eastern sultans, which was called the Parc aux Cerfs.

Louis died at Versailles, on the 10th May, 1774, 64 years of age. Two sons whom he had had by his wife were both dead: the eldest, the Dauphin, died in 1765, and left, by his wife, a Saxon princess, three sons, who have been in succession kings of France, namely, Louis XVI., Louis XVIII., and Charles X. Louis XV. had also by his wife several daughters, besides illegitimate children.

LOUIS XVI., grandson of Louis XV., succeeded him in 1774, being then twenty years of age. He had married, in 1770, Marie Antoinette, archduchess of Austria, sister of Joseph II. He chose for his minister of finance Turgot, an honest and enlightened man, who, in concert with his colleague Malesherbes, wished the king to institute various reforms, which had they been carried out, might perhaps have prevented the Revolution. But the clergy and the nobility strongly opposed these projects, the parliaments themselves were averse to such changes, and Turgot was dismissed. Louis however, following his own natural disposition, effected much partial good. The deficiency in the treasury, and the debt of four thousand millions of livres left by Louis XV., were the great stumbling-block of Louis's administration. He however went on for some years, during which he engaged in a war against England and an alliance with her revolted American colonies. In September 1783, peace was concluded at Versailles; England acknowledged the independence of the United States, and gave up to France Tobago and the coast of Senegal.

Meantime the financial embarrassment of the French government went on increasing. Necker, a Genevese banker, wealthy and retired from business, having become minister of finance in 1776, made many reforms. But in November 1783, by a court cabal, Necker was dismissed, and Calonne was substituted. He managed

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to go on a little longer, but without success; and after the Assembly of the Notables, which had been convoked for the purpose, had also failed to settle the question, and several successive ministers had tried in vain to supply the financial deficiency, Necker was recalled. He stated to the king that the only resource left was to call together the States-General of the kingdom, which had not been assembled since 1614. The king convoked them at Versailles in May 1789. These states had always consisted of the three orders—clergy, nobility, and the third estate, or commons. Each order formed a separate house; and, as a majority of orders decided, any project of law displeasing to the two privileged orders was sure not to pass those two houses, and was therefore lost. Necker, to obviate this difficulty, proposed to make the number of the third estate equal to that of the other two orders, which was done, and this was in fact the beginning of the Revolution.

The third estate was joined by many of the nobility, and, having thus gained the ascendancy, constituted itself the National Assembly, and changed the constitution to a limited monarchy. But it closed its sittings on the 30th of September; and the result of a general election was that the majority of the new representatives were either Jacobins or Girondists. The rest of the history of Louis XVI. is well known. He was put to death by the guillotine, Jan. 21, 1793; and his queen, Marie Antoinette, was executed in the following October.

LOUIS XVII., Duc de Normandie, second son of Louis XVI., remained in prison in the Temple after the death of his parents, and there he died of disease in consequence of ill treatment and privation, on the 9th of June, 1795. He was then ten years of age. He had been styled Louis XVII. by the royalists after his father's death.

LOUIS XVIII. was born in 1755. He was the brother of Louis XVI., during whose lifetime he was styled 'Monsieur.' Although styled king while exiled in England and elsewhere, he did not begin to reign until enabled to do so by the events of 1814. He granted his subjects a liberal charter, which continued to be the fundamental law of the kingdom, with the exceptions of some alterations made in 1830, until the Revolution of 1848. On the return of Napoleon from Elba [BONAPARTE], Louis was obliged to return to Ghent; but the victory of Waterloo, June 1815, again opened to him the way to Paris.

The new Chamber of Deputies, which was elected under the excitement of this second restoration, proved ultra-royalist in principle, and went further than the king. At last Louis dissolved the chamber. In the new elections the moderate constitutional party regained the ascendancy, and the king, in 1818, appointed a liberal ministry, at the head of which was Count Decazes. But the assassination of his nephew the Duke of Berry, by a fanatical republican, in February 1820, again alarmed the court, and restored the influence of the ultra-royalists. Decazes was dismissed, and Villèle was placed at the head of the ministry. The law of election was altered, the newspapers were placed under a censorship, and other measures of a retrograde nature were adopted. No open violation of the constitution however was committed. In September 1824, Louis XVIII. died, and was succeeded by his brother Charles X. He published, in 1823, the account of his emigration, 'Relation d'un Voyage de Paris à Bruxelles et Coblenz,' which is curious.

LOUIS, ST. [MISSOURI.]

LOUISBOURG. [CAPE BRETON.]

LOUISIADE ISLANDS is the name of an extensive group of islands situated in the Pacific Ocean, south-east of the great island of Papua, or New Guinea, between 8° and 12° S. lat., and 150° and 155° E. long.

Few islands of the Pacific have been less visited by European vessels than the Louisiade Islands, and our information respecting them is accordingly extremely scanty. We do not even know the number of the islands which belong to the group, but it is certain that they are very numerous. They occupy a space of more than 300 miles from N.W. to S.E., but none of them appear to be large. The inhabitants belong to the race of the Papuas, and are very averse to any intercourse with foreign vessels which visit the dangerous sea that washes their southern coast.

LOUISIANA, the most south-western of the United States of North America, comprehends the countries on both sides of the Mississippi, between 28° 56′ and 33° N. lat., and 88° 50′ and 94° 30′ W. long. It is bounded S. by the Gulf of Mexico, W. by Texas, E. by the state of Mississippi, and N. by that of Arkansas. The greatest length, N. to S., is 240 miles; the greatest breadth, E. to W., is 210 miles. The area is 45,350 square miles. The population in 1840 was 352,411, of whom 168,452 were slaves.

Louisiana presents a great variety of surface, though it is a plain country, and only in a very few places rises into hills of moderate elevation. The southern part of the state comprehends the whole of the delta of the Mississippi, which, below the mouth of the Red River, divides into several branches. The most western of these branches is the Atchafalaya, which leaves the main stream about three miles below the mouth of the Red River, and falls into Atchafalaya Bay, in the Gulf of Mexico. The southern part of the state consists to a considerable extent of swamps and marshes, and a large part of it is annually overflowed by the Red River and the Mississippi. By this overflow more earth is deposited on the margin of the Mississippi than farther back. This rich alluvial deposit extends 400 yards, and in some places a mile and a half from the river; and to regulate the overflow, and prevent the valuable land in the rear from being inundated, an artificial embankment, called the *Levee*, is raised on both banks of the river. On the eastern side the embankment commences 60 miles, and on the western 172 miles, above New Orleans. The northern part of the state has an undulating surface, and a heavy natural growth of timber, consisting of pine, oak, hickory, walnut, and other trees. In fact, the greater part of the state is covered with forests.

The chief rivers in this state are the Mississippi and its affluent, the Red River. [MISSISSIPPI, River.] The Sabine River, on the west, separates the state from Texas as far as 32° N. lat.; and the Pearl River on the east, in the lower part of its course, separates the state from that of Mississippi. Several other rivers flow through the state, of which the largest are the Washita, which falls into the Red River, and the Calcasiou, which falls into the Gulf of Mexico, after forming Lake Calcasiou. There are several other large lakes in the state.

There is a great quantity of exceedingly rich land in Louisiana, and large quantities of cotton, sugar, rice, maize, indigo, and tobacco, are produced. Large herds of cattle are fed in the natural meadows, and also great numbers of horses and mules. The winters are mild, and the summers very hot, and in the marshy parts very unhealthy.

The minerals of Louisiana are of little importance. There are salt springs in the northern districts, and coal and iron-ore are found in the north-western corner of the state.

Louisiana is divided into 38 parishes. *New Orleans*, on the left bank of the Mississippi, 105 miles by the course of the river, from its entrance into the Gulf of Mexico, is the seat of government, and the great centre of the commerce of the Mississippi. [ORLEANS, NEW.] The only other town which requires notice is *Natchitoches* (pronounced *Natches*), 368 miles N.W. by W. from New Orleans, following the courses of the rivers. It is situated at the foot of a bluff on the west bank of the Red River, 200 miles above its junction with the Mississippi. It has considerable trade, and had in 1840 a population of 2400, about half of whom are French. The place was settled by the French in 1717.

Several railroads and canals radiate from New Orleans in various directions. One of the most important of these works is the New Orleans and Nashville Railroad, now in progress, which extends 80 miles in this state, and when completed will be 564 miles in length.

Louisiana was originally settled by Roman Catholics, and they are still the most numerous sect. The chief educational establishments in the state are—Centenary College, at Jackson; St. Charles's College, at Grand Coteau; Baton Rouge College, at Baton Rouge; and Franklin College, at Opelousas; the number of students in these colleges in 1848 was 267.

The constitution of Louisiana was formed in 1812, in which year it was constituted a state. The governor is elected for 4 years, and receives 6000 dollars a year, which is a higher salary by 2000 dollars than is paid to any other governor. The legislature consists of 32 senators, who are elected for 4 years, and 98 representatives, who are elected for 2 years. Louisiana sends 2 senators and 4 representatives to congress.

The country called Louisiana, a term which comprised much more than the present State, was first explored by the French, and was so named after Louis XIV. A colony was settled in 1699. In 1717 the interest in the province was transferred to a chartered company, at the head of which was John Law, whose Mississippi speculation was a ruinous failure. In 1731 the company resigned its rights to the English government, by which in 1762 the whole of Louisiana was ceded to Spain. In 1800 the province was transferred by the Spaniards to the French, of whom it was purchased by the United States in 1803 for 15,000,000 dollars.

LOUISVILLE. [KENTUCKY.]

LOULE', a town of Algarve, Portugal, in a broad and fertile valley, 8 miles north of Faro. The town, which is surrounded by walls, contains about 8000 inhabitants, several churches and monasteries, and gives the title of Marquis to a noble Portuguese family.

LOURDES. [PYRENE'ES, HAUTES.]

LOUSE. [PEDICULUS.]

LOUTH, a maritime county of the province of Leinster in Ireland, is bounded N. by Armagh and Down; E. by the Irish Channel; S. and S.W. by Meath; and W. by Monaghan. It lies between 53° 43′ and 54° 7′ N. lat., 6° 6′ and 6° 41′ W. long. The greatest length N. to S. is 25 miles; the greatest breadth, E. to W., is 15 miles. The area is 316 square miles. The population in 1841 was 111,979, but, including the county of the town of Drogheda (16,261), the entire population is 128,240.

Surface and Rivers.—From the Boyne to the river of Dundalk, the county is mostly flat. The only eminences in this division at all conspicuous are in the southern part of the county; the chief among them are Belpatrick, Mount Oriel, Tullyesker hill, and Clogher-head. The Mattock River forms a boundary between Louth and Meath. The undulating plain, which extends from the hills to the river of Dundalk, is watered by the Dee, the Glyde, the Fane, the White, the Lagan, and other small rivers. Most of this district is under tillage, and in good cultivation.

Beyond the Castletown River the surface is of quite a different character. A group of mountains, ranging from 1000 to 1900 feet in height, and extending over a district 15 miles long and 5 miles broad, stretches across the Armagh border, and extends eastward into a great peninsula forming the northern boundary of the Bay of Dundalk and the southern limit of the Lough of Carlingford and basin of the Newry River. This group is divided into two nearly equal portions by a ravine traversing it from north to south, and forming a direct line of communication between Dundalk and Newry. Through this defile the great northern road is carried at a considerable height above the bed of a mountain-stream. The Kilcurry River, descending from the southern declivities, joins the Castletown River a short distance above the bridge of Dundalk. The glens and vales which lie along this border of the mountain-region possess much picturesque beauty. From the eastern side of Ravensdale the mountains stretch back to the river of Newry and Bay of Carlingford, which they overhang in masses rising almost immediately from the water's edge. Towards the extremity of the peninsula and along

that side bounding the bay of Dundalk the mountains leave a considerable margin of level land between them and the sea; indeed most of the coast is skirted by a broad sandy beach.

Geology, Soil, Productions.—The level portion of the county south of the river of Dundalk belongs generally to the clay-slate formation. Patches of carboniferous limestone occur in many parts of the county, skirted by yellow sandstone. The mountainous region consists of a nucleus of granite supporting the clay-slate and limestone of the surrounding field on its flanks. A great protrusion of crystalline greenstone trap occurs at the eastern extremity of the range. Iron and lead ore are the only minerals which have been observed, but nowhere in sufficient quantity to warrant mining operations. The soil of the southern division of the county is well calculated for every kind of grain-crop. Farming in general is carried on in a superior manner. Green crops are grown by almost all the gentlemen farmers. The fences are usually of quickset, and the lands well drained. In the mountain-district the condition of the people is much inferior, and the improved system of husbandry unknown. In 1847 there were 110,109 acres under crops, of which the chief were—corn and beans, 73,319 acres; potatoes, 3545 acres; turnips, 9215 acres; meadow and clover, 18,909 acres.

The linen manufacture is carried on with some activity at Ravensdale and Collon, where there are large bleach greens, but chiefly in Drogheda and its neighbourhood, where the trade is generally very brisk. The fisheries off the coast give occasional employment to several hundred persons.

Divisions and Towns.—Louth is divided into 6 baronies. It is in the archdiocese of Armagh and Tuam. It is in the north-eastern circuit, and the assizes are held at Dundalk. The county returns 2 members to parliament, and 1 member is returned for the borough of Dundalk. The following are the principal towns, with the population of each in 1841:—

Ardee, a market-town, 14 miles N.W. by N. from Drogheda, is situated on the north side of the small river Dee. It appears to have been a place of some importance formerly, but now consists of one main street, with several lanes branching from it. There are remains of two ancient castles, one of which has been fitted up as a court-house. The church, which originally belonged to a monastery, is a plain building, and there is a Roman Catholic chapel. Population, 3670.

Carlingford, a small fishing town, chiefly consisting of cabins inhabited by fishermen, is situated 14 miles E. by N. from Dundalk, on the south side of Carlingford Lough. Population, 1110.

Drogheda. [DROGHEDA.]

Dundalk, the county town, a parliamentary borough, and port, is situated 21 miles N. by W. from Drogheda, at the head of Dundalk Bay and at the mouth of the Castletown River. The town consists chiefly of two long streets, which intersect each other in the market-place, and in which are several good houses and shops, but most of the other houses in the lanes and suburbs are wretched cabins. The town contains a county court-house, guild-hall, prison, barracks, market-house, linen-hall, parish church, Roman Catholic and other chapels, and three endowed schools. Dundalk carries on a brisk trade, chiefly in the exportation of grain, cattle, and other agricultural produce, and in the importation of groceries and goods in boxes and bales for the supply of the counties of Louth, Monaghan, and Cavan. Steamers ply regularly to Liverpool twice a week. In addition to the coasting trade, and some foreign and colonial trade, the fishery district of Dundalk had, in 1844, 297 registered vessels. The borough returns 1 member to parliament. Population, 10,782.

History and Antiquities.—Louth, at the coming of the English, formed a portion of the territory of Orgial or Oriel. The eastern part of Orgial, constituting the present Louth, having been conquered by De Courcy between 1179 and 1180, was erected into a county by King John in 1210. Louth was not considered a portion of Leinster until the reign of Elizabeth. The forfeitures consequent on the rebellion of 1641, and the ensuing civil wars, extended over nearly the entire county.

The numerous antiquities which occur throughout Louth have been made the subject of a volume entitled 'Louthiana,' published at Dublin in 1758. Earthen mounds and intrenchments are of very frequent occurrence. The most remarkable in the county is that of Castle-Guard at Ardee. Its perpendicular height is nearly 90 feet, the depth of the main trench between 30 and 40, the circumference at the top 140, and round the base upwards of 600 feet. There is another earthen intrenchment near Dundalk; stone circles at Ballirckan and Ballinahatry; a cromlech at Ballymascanlan; round towers at Dromiskin and Monasterboyce; and remains of two others at Louth and Drogheda. Two beautiful stone crosses stand near the tower of Monasterboyce. The ruins of the abbey of Mellifont occupy a beautiful site on the bank of the Mattock River, near the Boyne. There are some very ancient ruins on the hill of Faughart, where Edward Bruce is said to be buried, connected with the old cell of St. Brigid. Of the various feudal buildings throughout the county the chief are the castle of Carlingford, erected by King John, Rohe's Castle, north-west of Dundalk, Torfeckan or Termonfeckin Castle, a residence of the archbishops of Armagh, inhabited last by Primate Usher, and Castletown, still kept in habitable order, on the south bank of the Castletown River near Dundalk.

LOUTH. [LINCOLNSHIRE.]

LOUTHERBOURG, PHILIP JAMES DE, was born at Strasburg, October 31, 1730, and studied under his father and Casanova. After having been admitted a member of the Paris Academy in 1768, Loutherbourg came over to England, was elected a royal academician in 1771, and was engaged as scene-painter at the Opera House. Soon after his settling in this country, Loutherbourg got up, under the name of the *Eidophusikon*, an

exhibition displaying the changes of the elements and their phenomena. Two of his chief pictures were, Lord Howe's Victory in 1794, and the Battle of the Nile. He resided in London till his death in 1812.

LOUVAIN. [Brabant, South.]

LOUVIERS. [Eure.]

LOVE-APPLE, a fruit-bearing annual, also called Tomato, is the *Solanum Lycopersicon* of botanists, a plant much cultivated for the sake of its berries, from which are obtained various preparations used for culinary purposes. It is a native of Peru and Brazil, whence it has been carried into North America and the Old World; and it has become, as it were, naturalised in some parts of India.

LOVAT, LORD. Simon Fraser, afterwards Lord Lovat, was born in 1668, at Beaufort, near Inverness. The principal events of his life are connected with the two rebellions of 1715 and 1745, in which he continued to forward both interests. Previous to the first rebellion he was despatched by the 'Old Pretender' to Scotland, with proper credentials, arms, ammunition, and money to promote the rising. But he betrayed his trust, and fought on the side of the king, for which he received his title and estates. In 1745 he joined the party of Charles Edward, not in his own person, but by means of his son, whom he sent with the Frasers. His concurrence in his son's course being discovered, he was taken, and executed on Tower Hill, April 9, 1747.

LOVERC. [Bergamo.]

LOVELACE, RICHARD, born in 1618, was the son of a Kentish knight. He entered the army under the patronage of Goring. The county of Kent deputed him to present their petition in favour of the king to the Long Parliament; and for doing this he was imprisoned in the Gatehouse, and released only on giving bail in forty thousand pounds. In 1646 he raised a regiment in the French service, commanded it, and was wounded at Dunkirk. Returning to England in 1648, he was again imprisoned, and remained in confinement till after the king's death. In 1649 he published 'Lucastu's Odes, Sonnets, Songs,' &c., the lyrical pieces in which have much spirit and vigour. He also wrote two plays, but they were never published. He died of consumption, in great distress, in a mean lodging in London, in 1658.

LOW COUNTRIES, a district in the north of Europe, comprehending the kingdoms of the Netherlands and Belgium, and grand-duchy of Luxemburg.

LOWELL. [Massachusetts.]

LOWTH, WILLIAM, born 1661, died 1732. He was brought up at Merchant Taylors' School, whence he was sent to St. John's College, Oxford. Early in life he became chaplain to Mew, bishop of Winchester, who gave him a prebend in the cathedral of Winchester, and the rectory of Buriton in that diocese, where he lived, died, and was buried.

If we would form an idea of the extent of his laborious reading, we must look rather to the works of other persons than his own, and particularly to Potter's edition of the works of Clemens Alexandrinus, and Hudson's edition of the works of Josephus. To both these editors he communicated valuable notes. Of his own writings, those which are now most read are his 'Directions for the Profitable Reading the Holy Scriptures,' which was first published in 1708, and has been often reprinted, and his 'Commentary on the four greater Prophets.'

LOWTH, ROBERT, born 1710, died 1787, a prelate of the English Church, son of William Lowth last named, and, like his father, distinguished by his knowledge of the books of Scripture and his valuable writings in the illustration of them. He was also an elegant scholar, and an inquirer into minute and curious history.

He was educated at Winchester College, whence he passed to New College, Oxford. In 1766 he became Bishop of St. David's; in the same year he was translated to Oxford; and in 1777 was made Bishop of London.

His 'Life of William of Wyckham,' published in 1758, is an admirable specimen of the results to be attained by curious and recondite biographical research. His 'Lectures on the Poetry of the Hebrews' were delivered by him at Oxford, when he was professor of poetry. They were received with great respect by the learned, not of England only, but of the Continent, where they were reprinted, with valuable notes by Michaelis. These lectures were published by Lowth in Latin, the language in which they were delivered; but there is an English translation of them by Dr. Gregory, published in 1787. In 1778 he published a 'Translation of the Prophet Isaiah,' distinguishing the poetical from the parts written in prose, and exhibiting the various forms of Hebrew parallelisms which occur in that prophet. He gave a large body of valuable notes. He also published an 'Introduction to English Grammar.'

LOXA, or LOJA, a town of Spain, in the province of Granada, 30 miles west of Granada, at the north base of a ridge of hills, and in a valley watered by the river Genil. It has manufactories of printed cottons and paper, a clerical college, two hospitals, and 13,000 inhabitants.

LOXI'ADÆ, Mr. Vigors' name for a family of *conirostral birds*, forming the third tribe of his *Insessores*. Mr. Swainson, in his 'Classification of Birds,' adopts a very different arrangement, and places the Crossbills under his sub-family *Pyrrhulinæ*. British ornithologists generally adopt the arrangement of Mr. Vigors.

Genus *Loxia*, the Crossbill.—Bill moderate, strong, very much compressed; the two mandibles equally curvêd, hooked, and the elongated points crossing each other. Nostrils basal, lateral, rounded, concealed by hairs directed forwards. Feet with three toes before and one behind; anterior toes divided. Wings moderate, the first quill longest. Tail forked.

M. Temminck, who gives the above generic character, records two species, *Loxia Pytiopsittacus* and *L. curvirostra*, in his second edition (1820), and *L. leucoptera*, in his third part of that edition (1835). The same three species, the first under the name of *L. pinetorum*, are recorded by Mr. Swainson.

The genus is found in the north both of Europe and America. One species however, *L. curvirostra*, is found in Japan as well as in Europe.

Example, *L. curvirostra*, the Common Crossbill.

Crossbill (*Loxia curvirostra*).

For an elaborate account of the anatomy of the mandibles of this bird, see Yarrell in 'Zool. Journal,' vol. iv.

For an interesting description of the changes of plumage, habits, and manners of the species, see Temminck; Gould ('Birds of Europe'); Selby; Yarrell ('Brit. Birds'); Willoughby; 'Proceed. Zool. Soc.,' 1834; Loudon's 'Mag. of Nat. Hist.,' Jan. 1834.

This bird is *Loxia curvirostra* of Linnæus; *Becco in Croce, Crocione,* and *Crosiero* of the Italians; *Bec Croisé* of the French; *Kreuzschnabel* of the Germans; *Crossbill,* or *Shell-Apple* of the British.

LOYOLA, IGNATIUS. *Don Iñigo Lopez de Recalde,* more generally known under the name of Loyola, was the youngest child of Don Bertram, lord of Ognez and Loyola. He was born in 1491, at the castle of Loyola, in Guipuzcoa. In early youth he was attached to the court of Ferdinand and Isabella in the quality of a page, and afterwards distinguished himself as a soldier. In his 30th year, while assisting in the defence of Pampeluna, against the French, he was severely wounded. A long and painful confinement was the result of his wounds. To relieve its weariness he was furnished with works of mystical devotion and the lives of saints. He has graphically described the various scenes through which he passed in his introduction to a religious life, in his 'Spiritual Exercises.' From this time all his desires were directed to one great object—an entire devotion to the service of God. He resolved upon retiring to a Benedictine monastery at Mount Serrat, in order to prepare himself for a pilgrimage to the Holy Land. On his return he passed the vigil of the Annunciation, March 24, 1522, in the church of the Holy Virgin, at Mount Serrat; on its altar he hung up his arms, the trophies of his worldly triumphs, and vowed obedience to the commands of God's church. He determined to perform barefoot his intended pilgrimage, and in the coarse raiment of a beggar. On leaving Mount Serrat, he went to the hospital of the Dominican convent at Manresa, where his deeds of charity soon acquired for him celebrity in that town, and the admiration of the multitude, to avoid which he retired to a cavern at a short distance from Manresa, where he redoubled the severity of his penances, and was one day found in a state of inanimate exhaustion at the door of his cell. After residing ten months at Manresa, he left for Barcelona, whence he embarked for Rome. In that city he obtained the blessing of the Pope Adrian VI. upon his enterprise, and resumed his journey alone, fasting daily and begging alms. From Cyprus he embarked with some pilgrims for the Holy Land, and reached Jerusalem September 4, 1523. He was refused permission of residence from the primate of the Church of Rome at Jerusalem. He reached Venice in January 1524, and thence he returned to Barcelona. In this town he determined upon making some stay in order to study. At the age of thirty-three he began to apply himself to the rudiments of grammar. He continued studying at Barcelona till the attempts on his part to reform some irregularities in a convent of nuns exposed him to the vengeance of those who had partaken in their disorders. He then retired to the University of Alcala. A religious address which he delivered to the students was the occasion of his dismissal from that university. In 1527 he went to Salamanca, where he fell under the displeasure of the Inquisition, who punished him by a severe confinement, and dismissed him from their city. He next repaired to Paris, where he arrived in February 1528. He applied himself to the studies of the university, humbly placed himself in the class of the least advanced scholars, and besought their teacher to treat him as one of them. Two students shared his rooms, Peter Faber and Francis Xavier of Navarre. The three companions formed the closest intimacy, sharing each other's toils and gains. Shortly after, three more students joined his small society. On Aug. 15, 1534, they assembled at the church of Montmartre, where they took the solemn vows of chastity, absolute poverty, devotion to the care of Christians, and to the conversion of infidels. They resolved on proceeding to Jerusalem, and, in case impediments should be put in their way, upon placing themselves under the guidance of the Pope, and implicitly submitting to his directions. Such was the humble origin of the famous Order of the Jesuits. Their services were gratefully accepted by the reigning pontiff.

On September 27, 1540, Paul III. sanctioned, under some limitations, the establishment of the Order, and finally, in 1543, made the sanction unconditional. Loyola was chosen president. He remained at Rome as the centre from which he was to direct the movements of the society. His time was spent there in revising its constitutions, and in works of charity. He founded an asylum for the protection of Jews who had become proselytes to Christianity, and a penitentiary, where the victims of seduction might reform their lives. In the year 1546 Francis Borgia founded their first college at Gandia in Spain. On July 31, 1556, Loyola died.

The memory of Ignatius was consecrated by beatification in 1609, and he was canonised as a

saint by Pope Gregory XV. in 1622. His festival is celebrated on July 31.

His life has been written by Gonzales and Ribadenëira; by Maffei in Latin; and by Bartoli and Bouhors in French. His 'Spiritual Exercises' were published at Rome in 1548, and have been translated into French by Drouet de Maupertuis and Clément. His 'Maxims' translated were published at Paris in 1683.

LOZE'RE, a department in France, formed chiefly out of the old district of Gevaudan, lies between 44° 7′ and 44° 58′ N. lat., 3° and 4° E. long., and is bounded N. by Cantal and Haute-Loire, E. by Ardèche, S. by Gard, and W. by Aveyron. Its greatest length is 60 miles, and its mean width is 39 miles. The area is 1987 square miles, and the population in 1846 was 143,331; which gives 72.129 to the square mile, being 101.621 below the average per square mile for all France.

The department is covered by the Cévennes Mountains in the south-east, which rise in Mont-Lozère (whence the name of the department) to the height of 4887 feet above the sea-level; by the Margeride chain in the east and north-east; by the Aubrac Mountains [AVEYRON] in the centre and west; and in the south-west by high plains, called *caussées*, many of which are of great fertility. The melting of the snow, that lies on these mountains for several months in the year, gives rise to a great number of rivers, which drain the three slopes formed by the disposition of the masses before named. The north-eastern slope belongs to the basin of the Loire, and is drained by the ALLIER and some of its feeders; the south-eastern slope makes part of the basin of the Rhone, and is drained by Gardon-d'Alais and the Gardon-d'Anduze [GARD]; and the western slope, which is included in the basin of the Garonne, is drained by the TARN, the LOT, and the Truyère [CANTAL].

The climate is variable and cold; winter lasts about four months in the southern part of the Cévennes, and is prolonged to six months in the north of the department; the spring is very rainy, and violent storms are frequent in summer.

The nature of the soil presents great obstacles to the labours of the farmer; yet in most instances the land everywhere that is capable of cultivation is well tilled. The chief crops raised in the north of the department are rye, some barley, oats, and hay; in the *caussées* wheat, barley, oats, fruits, &c., are grown; and, in the Cévennes, the chestnut and the potato are the chief support of the population. The vine is cultivated in some favourable situations; but the quantity of wine produced does not suffice for the consumption, and the same may be said for the cereal productions of the department. In the south-eastern slope of the department the mulberry is grown for the production of silk. The mountain pastures are extensive, and of excellent quality; great numbers of fine-woolled sheep are reared. Horses are not numerous; but mules and horned cattle are. Amongst the wild animals are wolves, badgers, great numbers of hares and rabbits. Medicinal plants, and plants used in tanning and dyeing, are abundant. The forest timber is composed of oak, beech, fir, chestnut, &c.

Iron, lead, antimony, and copper are found, but few mines are worked. In the Gardon and in the Cèze [GARD] particles of gold are found after heavy rains. Marble, porphyry, granite, gypsum, basalt, &c., are also met with. Mineral springs are numerous.

The manufactures are unimportant; some woollen yarn, serge, blankets, drugget, and cotton cloth, nearly all for home use, are the chief products. In the arrondissement of Florac there are some cotton-spinning and silk-throwing establishments. Paper, leather, felt hats, parchment, tiles, and earthenware are also made. About 40 fairs are held in the year. The commerce of the department, owing to the want of water communication and good roadways, is confined to articles of mere necessity, and is altogether insignificant.

The department contains 1,272,132 acres, distributed among 45,227 proprietors, and into 554,506 parcels. Of this area, 515,629 acres are arable; 110,185 are covered with woods and forests; 443,273 consist of natural pastures, heaths, and moors; and 72,306 are under different kinds of culture.

The department is divided into 3 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Mende . . .	7	62	47,894
Florac . . .	7	53	40,780
Marvejols . .	10	76	54,657
Total . .	24	191	143,331

The arrondissement of Mende is named from its chief town, *Mende*, which is situated in a valley surrounded by high hills, on the right bank of the Lot, in 44° 31′ N. lat., 3° 29′ 41″ E. long., and has a tribunal of first instance, ecclesiastical and communal colleges, a public library, and 5921 inhabitants. The town is surrounded by ramparts, which form a pretty walk; the streets, many of which are supplied with fountains, are narrow and crooked. Mende is the seat of a bishop; the cathedral, and former episcopal palace, which is now the residence of the prefect of Lozère, are the most remarkable buildings. This town has manufactures of coarse woollen cloths; paper also is made. About 10 miles from Mende in the valley of the Lot is *Bagnols-les-Bains*, a small village famous for its medicinal springs and baths. *Langogne*, a small town, with an ecclesiastical school, and 2803 inhabitants, is situated on a high plateau near the source of the Allier, on the eastern border of the department. *Villefort*, a small place of under 2000 inhabitants, situated at the foot of Mont Lozère, is important for its lead and copper mines.

In the arrondissement of Florac, the chief town, Florac, is situated on the left bank of the Tarnon, a feeder of the Tarn, and has a tribunal of first instance, and 2153 inhabitants. *St.-Germain-de-*

Calberte, S.E. of Florac, is situated in a district almost entirely covered with mulberry plantations, and has 2025 inhabitants, who raise a considerable quantity of raw silk. *Meyrueis*, near the southern border of the department, on the right bank of the Yonte, a feeder of the Tarn, has hydraulic saw mills, manufactures of hats, cheese, lace, wire for cards, and knitting needles. The population is 2005.

In the arrondissement of Marvejols, the chief town is *Marvejols*, which is situated in a valley planted with fruit trees, on the right bank of the Colagne (a feeder of the Lot), 12 miles W. from Mende, and has a tribunal of first instance, a college, an ecclesiastical school, and 4142 inhabitants, who manufacture woollen cloth and yarn, leather, bricks, &c. The town is regularly built, well paved, and ornamented with fountains. A canal from the Colagne supplies the dye-houses of the town with water, and drives the machinery of several factories.

The department forms the see of the Bishop of Mende, is included in the jurisdiction of the Cour Royale, and University Academy of Nîmes, and belongs to the 9th Military Division, of which Montpellier is head-quarters. Under the monarchy it returned 3 members to the Chamber of Deputies; it now has 4 representatives in the National Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1849.)

LÜBECK is situated in 53° 51′ N. lat., 10° 50′ E. long., on a long eminence between the rivers Trave and Wakenitz. Its territory is bounded E. by Mecklenburg Strelitz, W. by Oldenburg and Holstein, and S. by Lauenburg; the northern part, between Holstein and Mecklenburg, extends to the Baltic. Its territorial possessions were formerly very scattered; some detached portions were in Holstein, some in Lauenburg, and others in Mecklenburg. By the decision of the diet in 1803, modified in 1804 by a treaty with Oldenburg, it obtained, in exchange for many of its distant districts, a continuous tract on the Trave. Lübeck is no longer a fortified town; the old ramparts are converted into public walks, and the city is very clean and cheerful. The interior is intersected by several broad and straight streets. The houses are built of stone. A great number of them are in the old-fashioned style, with the gable ends towards the street, but the more modern are in better taste. Besides the cathedral, which contains valuable paintings and remains of antiquity, there are five parish churches, of which that of St. Mary (Marienkirche) is celebrated as one of the finest Gothic churches in northern Germany. Lübeck has a gymnasium, several charitable institutions, a school of design, a Roman Catholic chapel, and a Calvinist church. The senate-house, an ancient Gothic building, contains the hall where the deputies of the Hanseatic League formerly met.

The territory already mentioned, including the district of Vierlande, which Lübeck possesses in common with Hamburg, is 126½ square miles in extent, with a population of 47,197, that of the city being 25,339. The manufactures are of very various kinds, but none on a large scale.

The commerce of the city is of considerable importance. Lübeck has 80 ships of its own, and the arrivals are above 800 annually. The principal export and import trade is with Russia, Sweden, and Denmark; vessels of 9 feet draught can come up to Lübeck, where they enter a spacious basin lined with quays; larger ships discharge their cargoes by lighters at *Travemünde*, which is situated at the entrance of the Trave into the Baltic, and has a fine secure harbour. Travemünde is a pretty little town, much resorted to in the bathing season, and has a resident population of 1200. Steamers ply from Travemünde to St. Petersburg, Copenhagen, Hamburg, Amsterdam, and Stockholm. Small steamers convey passengers up the river to Lübeck.

LUBIENIETSKI (Latinised *Lubieniecius*). There are five persons of this name (one Andrew, two Christopher, and two Stanislaus), all distinguished in the Polish Socinian controversy. A list of their several writings may be found in Sandius, 'Bibl. Antitrin.,' Freistadt, 1684. The subject of the present article is Stanislaus the younger, son of Christopher, who was born at Cracow, August 23, 1623, and died in exile at Hamburg, May 18, 1675. But the work which makes his reputation European, and entitles him to a place here, is his 'Theatrum Cometicum,' published in 1667.

The 'Theatrum Cometicum' consists of three parts. The first contains the correspondence of the author with men of science throughout Europe on the subject of the comets of 1664 and 1665. The second part contains an elaborate account of all the comets (415 in number) recorded in history down to the year 1665. It is written in support of the hypothesis that comets portend both good and evil, in opposition to the prevailing notion that they were harbingers of misfortune only; and this opinion is supported by history, it being clearly shown that public events of both characters usually followed close upon comets.

In the late discussions about Halley's comet this work of Lubienietski was freely cited in proof of one and another former appearance, or presumed appearance, of that memorable body. It seems to have been taken for granted that the mere mention of a comet by this author is sufficient evidence of its having really appeared. It may be useful therefore on future occasions to recommend those, who would prove a comet from the 'Theatrum Cometicum' (and the same caution may be given with respect to Riccioli's list), first to examine the authority on which the fact rests.

LUBLIN. [Poland.]

LUBLIN, the capital of the Russian province of Lublin, is situated on an eminence above the river Bystricza, in 51° 16′ N. lat., 22° 30′ E. long., and has 13,300 inhabitants. The city, which is surrounded with walls, ditches, and great lakes, is divided into an upper and lower town, of which the latter is chiefly inhabited by Jews. It has a dilapidated castle on a hill, and is the seat of a bishop and court of appeal. The most considerable buildings are the town-hall and the 18

churches; there are also a Piarist college, a synagogue, a gymnasium, several hospitals and charitable institutions. The town has three annual fairs, and a considerable trade in woollen cloths, wine, corn, &c.

LUC, DE. [DELUC.]

LUC, LE. [VAR.]

LUCA'NIDÆ, a family of coleopterous insects, called Stag-Beetles, from the extraordinary development of the mandibles of the males. Some of the foreign genera of stag-beetles are remarkable for brilliance of colouring. In Britain we have four species, which belong to as many genera. Type, the Common Stag-Beetle (*Lucanus Cervus*). (Westwood's 'Introduction to the Modern Classification of Insects,' vol. i.)

LUCA'NUS, MARCUS ANNÆUS, was born at Corduba (Cordova), in Spain, A.D. 38. He was the son of M. Annæus Mela, the brother of the philosopher Seneca, and was carefully educated at Rome. His poetry recommended him to the notice of Nero, who bestowed upon him the dignity of quæstor and augur. Lucan did not however remain long in the imperial favour, for he was a poet, and his master affected to be one. Lucan, it is said, was forbidden to publish any more poems; and he entered into a conspiracy with Piso and others to assassinate Nero. (Tacitus, 'Ann.,' xv. 49.) This conspiracy was detected, and Lucan, being condemned to death, opened his veins A.D. 65.

Lucan wrote many poems; but his only extant poem is on the civil war between Cæsar and Pompeius, entitled 'Pharsalia,' which gives (in ten books) an account of the war from its commencement to Cæsar's visit to Cleopatra in Egypt. As the 10th book leaves off abruptly in the midst of a narrative, it is probable that the poet had not finished the work at the time of his death. The 'Pharsalia' contains many vigorous and animated descriptions, and the speeches are characterised by considerable rhetorical merits; but the language is often inflated, and the expressions extremely laboured and artificial.

The best editions of Lucan are by Oudendorp (1728), Burmann (1740), Bentley (1760), and Weise (1835). There are French translations of the 'Pharsalia' by Marmontel (1766), and Brébeuf (1795); in Italian, by Cristoforo Bocella (1804); in English, by Rowe (1718), and by May (1627), who also published in 1630 a continuation of the poem to the death of Julius Cæsar, which he afterwards translated into Latin verse (1640).

LUCAYOS. [BAHAMAS.]

LUCCA, DUCHY OF, a small state in Italy, is bounded N. by Modena, E. and S. by Tuscany, and W. by the sea. It is watered by the river Serchio, which rises in the Apennines, and enters the Mediterranean a few miles north of the Arno. Its area is 433 square miles. Its population in 1844 was 168,198. In consequence of the abdication of the Duke of Lucca (Oct. 5, 1847), and by virtue of a clause in the treaty of Vienna, the territory of Lucca has been annexed to Tuscany since Oct. 11, 1847. This territory is naturally divided into three regions: 1st, the mountainous districts among the Apennines, including the valley of the Lima, and the affluents of the Serchio; 2ndly, the valley of the Serchio, including the fine plain of Lucca, which is cultivated like a garden; 3rd, the flats near the sea, which are in part marshy, but produce good pasture for cattle. The country is divided for administrative purposes into eleven Comuni, in each of which there is a political officer called Gonfaloniere, and likewise a judge called Commissario Giusdicente. In the town of Lucca are the civil, criminal, and commercial tribunals for the whole duchy, a Lyceum with 28 professors, and a library of 16,000 volumes, two theological seminaries, a college, 16 grammar-schools, and a great number of elementary schools.

Viareggio, with 6000 inhabitants, is, next to Lucca, the principal town of the duchy; it has a roadstead which is frequented by coasting vessels, both native and foreign, which take away cargoes of oil, timber, silk, beans, and other minor articles. The principal article of import is salt fish. The manufactures of the country consist of silks, woollens, paper, glass, iron and copper ware; linen, cotton, and hats.

LUCCA, the capital of the duchy, is situated in a rich plain watered by the Serchio, and surrounded by mountains: it is 12 miles from the sea, and about 10 N.E. of Pisa, and contains 24,000 inhabitants. Lucca is surrounded by ramparts, which are planted with trees, and form a very pleasant promenade. The town is well built, and well supplied with water; the streets are well paved and clean. Lucca, like most other Italian cities, is rich in churches: the cathedral, which belongs to the 11th century, is adorned with good paintings, and with statues and monuments by the native sculptor Civitali. The archiepiscopal archives and those of the chapter contain a vast mass of historical documents, parchments, and MSS., some as old as the 7th century. The other remarkable churches of Lucca are those of San Frediano, San Francesco, and San Michele. The ducal palace is a vast building; it has a gallery of valuable paintings by the great masters, and a library of 25,000 volumes. The other remarkable structures are—the town-house, the aqueduct, now in course of construction, the public library, and several of the mansions of the nobles. The Academy of Letters and Sciences of Lucca, instituted in 1817, which consists of thirty-six members, holds its meetings once a month, and has published several volumes of memoirs. Lucca (Luca) is mentioned in ancient history as a town belonging to the Etruscans after they had conquered the country between the Arno and the Macra and taken it from the Ligurians. It afterwards became a Roman colony. There are still remains of a Roman theatre, and an amphitheatre.

LUCERA. [CAPITANATA.]

LUCERN. [LUZERN.]

LUCERN. [MEDICAGO.]

LUCERNAL MICROSCOPE, an optical instrument invented by Mr. George Adams, an optician in London. It consists of a hollow pyramidal box, at the smaller extremity of which is a tube carrying the usual system of lenses for magnifying objects. At the larger end, which is towards the observer, there are two lenses in

frames, their axes, as well as those of the small lenses at the opposite extremity, being coincident with the axis of the box; and between the exterior of the two lenses and the eye of the observer there is usually placed a plate of glass, rough-ground on one side, which serves as a screen to receive the rays of light proceeding from the object whose representation is to be viewed. The object is fixed in a small frame, as usual, and is placed in a groove made for the purpose immediately beyond the tube containing the system of lenses at the small end of the box. Instead of the plate of ground glass, a board painted white is frequently placed, to serve as a screen, at the distance of 6 or 8 feet from the instrument. Such a screen should have the form of a segment of a hollow sphere, the light being received on its concave surface.

An Argand lamp is usually placed beyond the object, with respect to the microscope, but for this the oxy-hydrogen light may be advantageously substituted: the light, after passing through a hemisphere of glass, is, when an opaque object is to be viewed, made to fall in a convergent state upon a small concave mirror, which is so inclined as to reflect the light back upon the object; and from the different points on the surface of the latter the pencils of rays proceed through the object-lenses and the box to the glass screen.

By the refraction of the light in passing through the lenses a highly magnified image of the object is formed; and several persons may then place themselves so as to see the image on the screen at the same time; or, by placing the eye at a small aperture in the produced axis of the instrument, one person may, with a pencil, draw on the glass, or on tracing-paper laid over it, the figure of the object, it being understood that the instrument is used by night or in a darkened room.

When the object to be viewed is transparent, the light is made to fall in a condensed state upon it, after having been transmitted through a convex lens, or two such; and from the object the rays proceed as before to the screen through the system of lenses which constitute the compound object-glass of the microscope, and through those at the opposite extremity of the box.

LUCHETTO DA GENOVA. [CAMBIASO.]

LUCIA, ST. [ANTILLES; WEST INDIES.]

LUCIAN a Greek writer, was born at Samósata, a city on the west bank of the Euphrates, in the Syrian province of Commagéne. He was born about the latter end of Trajan's reign, lived under both the Antonines, and died in the reign of Aurelius Commodus, or shortly afterwards. His parents, who were in humble circumstances, placed him with his maternal uncle, a sculptor; but he soon quitted this trade, and applied himself to the study of the law. He afterwards practised at the bar in Syria and Greece; but, not meeting with much success in this profession, he settled in Gaul as a teacher of rhetoric, where he had a numerous school. He appears to have remained in Gaul till he was about forty, when he gave up the profession of rhetoric, after having acquired considerable wealth. The greater part, if not all, of his dialogues appear to have been written after this time. During the remainder of his life he travelled about and visited successively Macedonia, Cappadocia, Paphlagonia, and Bithynia. The greater part of his time however was passed in Athens. Towards the latter part of his life he held a lucrative public office in Egypt, which was bestowed upon him by the Emperor Commodus.

The dialogues of Lucian are written in pure and elegant Greek. He had great wit, and the flow of his dialogue is easy and natural. He exposed fanaticism and imposture, the impositions of priests, the folly and absurdity of the superstitious, and especially the solemn nonsense and the immoral lives of the philosophical charlatans of his age. He was more like Voltaire than any other ancient writer. (See his 'Alexander.') Many of his pictures, though drawn from the circumstances of his own times, are true for every age and country. As an instance of this, we mention the essay entitled 'On those who serve the Great for Hire.' That he should have attacked the Christians in common with the false systems of the Pagan religion is not surprising, if we admit that Lucian probably never took the trouble to inquire into the doctrines of a religion which was almost universally despised, in his time, by the higher orders of society. Lucian had a taste for art, which he has shown by his descriptions in his 'Aetion,' 'Zeuxis,' 'Eikones,' &c.

The best editions of Lucian's works are by Hemsterhusius, who only edited part of the first volume, and Reiz (4 vols. 8vo.), by Lehmann (Leip., 9 vols. 8vo.), and the edition published by the Bipont Society; the best translation of Lucian in German is by Wieland (6 vols. 8vo.); there is an English translation by Tooke (Lond., 2 vols. 4to., 1820).

LUCIAN, SAINT, presbyter of Antioch, suffered martyrdom during the reign of Diocletian, A.D. 312, and was buried at Helenópolis in Bithynia. He is frequently mentioned by ecclesiastical writers as a man of great learning and piety. His fame rests upon his profound and laborious study of the scriptures, of parts of which he made many highly prized versions.

LU'CIDA, a name formerly given to the brightest star in any constellation: thus we have Lucida Hydræ, Lucida Lyræ, &c.

LU'CIFER, bishop of Cagliari in Sardinia, is principally known in ecclesiastical history for refusing to hold any communion with the clergy who had, during the reign of Constantius, conformed to the Arian doctrines, although it had been determined in a synod at Alexandria, A.D. 352, to receive again into the church all the Arian clergy who openly acknowledged their errors. Lucifer in consequence left the Catholic church, and his followers were called Luciferians. Their opinions were advocated by several eminent men; among others by Faustinus, Marcellinus, and Hilarius. Jerome wrote a work in refutation of their doctrines, which is still extant. Lucifer was banished from Sardinia by Constantius, and he resided for many years in Syria; but after the death of this emperor he returned to his diocese, where he died about A.D. 370. The writings of Lucifer were published by Tillet, Paris, 1568.

LUCI'LIUS, CAIUS, was born at Suessa

Aurunca (*Sessa*), a town in the north-western part of Campania, B.C. 148. The time of his death is uncertain. Lucilius is said by Horace ('Sat.' i. 1, 61) to have been the first writer of Roman satire; by which he means that Lucilius was the first who constructed it on those principles of art which were considered in the time of Horace as essential requisites in a satiric poem. The satires of Lucilius were very popular even in the Augustan age. Besides his satires, in thirty books, Lucilius wrote a comedy entitled 'Numularius,' epodes, and hymns, none of which are extant, with the exception of a few fragments from his satires, which were collected and published by Douza, Leyden, 1597.

LUCIUS I. II. III. [POPE.]

LUCKENWALDE. [BRANDENBURG.]

LUCKNOW, the capital of the kingdom of Oude, stands on the right bank of the river Goomty, in 26° 51′ N. lat., and 80° 50′ E. long. It became the residence of the court in 1775, after which it was considerably enlarged, and soon became one of the wealthiest cities of Hindustan.

Lucknow consists of three distinct quarters: the first, or oldest part, is made up of narrow and dirty streets, and is very populous. The second quarter consists of one handsome street, with a well-built market-place in the centre, and with smaller streets branching from it at right angles. The greater part of the houses in this quarter are the property of the king, and are occupied by branches of his family or persons attached to the court. A space between this street and the river contains the royal palace and gardens. The remaining quarter of the city is built in a purely Oriental style, and contains many splendid houses and religious edifices. The entire population is estimated at 300,000.

LUÇON. [PHILIPPINE ISLANDS; VENDE'E.]

LUCRETIA. [BRUTUS, M. JUNIUS.]

LUCRE'TIUS, with his full name TITUS LUCRETIUS CARUS, was born B.C. 95, and died B.C. 52, in the forty-fourth year of his age. The poem of Lucretius, entitled 'De Rerum Natura' (*On the Nature of Things*), in six books, contains a development of the physical and ethical doctrines of Epicurus. [EPICURUS.] Notwithstanding the unpromising nature of his subject, there is no writer in whom the Latin language displays its majesty and stately grandeur so effectively as in Lucretius.

The best editions of Lucretius are by Lambinus, whose commentary is very useful, 1563, 1570; Havercamp, 1725; Wakefield, 1796-97; Eichstädt, 1801; and Forbiger, 1828. The translations most worthy of notice are, the English by Creech, and by Mason Good, with the Latin text, and notes in 2 vols. 4to., 1805; the French by Lagrange, with the Latin text, 1799; the German by Meinecke, 1795, and by Knebel, 1821; and the Italian by Marchetti, 1717, frequently reprinted.

LUCRINE LAKE. [AVERNO.]

LUCU'LIA, a genus of the natural family of *Rubiaceæ*, sub-order *Cinchonaceæ*, tribe *Cinchoneæ*, and sub-tribe *Eucinchoneæ*, thus indicating the close affinity of this genus to that of the trees yielding Peruvian bark, or true Cinchonas, in which indeed the only known species, *L. gratissima*, was placed by Dr. Wallich and figured in his 'Tent. Fl. Nepal,' t. 21. It is found in great abundance on some of the other smaller hills in the Valley of Nepal. It delights in exposed and rather naked situations, blossoming, according to the situations where it is found, nearly the whole year round. As seen by Dr. Wallich, it attains a height of sixteen feet, but he was informed of its growing to a larger size. It has been introduced into and has flowered in this country; but, from the nature of the climate where it is indigenous, it is only suited to the green-houses of England.

LUCULLUS, LU'CIUS LICI'NIUS, descended from a distinguished Roman family, was born about B.C. 115, and served under Sulla in the Marsian War. Whilst Sulla was besieging Athens (B.C. 87), Lucullus was sent into Egypt and Africa to collect a fleet; and, after the conclusion of the war with Mithridates, he was left in Asia to collect the money which Sulla had imposed upon the conquered states. Sulla dedicated his Commentaries to Lucullus, and by his testament made him guardian to his son.

In B.C. 74 Lucullus was elected consul, and was appointed to the command in the war against Mithridates. During the following eight years he was entirely engaged in conducting this war, and in a series of brilliant campaigns completely defeated Mithridates and his son-in-law Tigranes. Lucullus never appears to have been a favourite with his troops; and their disaffection was increased by the acts of Clodius, whose sister Lucullus had married. The popular party at home also attacked a general who had been the personal friend of Sulla, and who was known to be a powerful supporter of the nobility. They eventually carried a measure by which he was removed from the command, and succeeded by Pompeius, B.C. 66. Lucullus, on his return to Rome, took no part in public affairs, and passed the remainder of his life in retirement. The immense fortune which he had amassed during his command in Asia he employed in the erection of magnificent villas, and he lived in a style of magnificence and luxury. Lucullus was a man of refined taste and liberal education; he wrote in his youth the history of the Marsian War in Greek, and was a warm supporter of learning and the arts. His houses were decorated with the most costly paintings and statues, and his library was open to all learned men. He lived on intimate terms with Cicero, who has inscribed the fourth book of his 'Academical Questions' with the name of his friend. Plutarch wrote a Life of Lucullus.

LUDLOW. [SHROPSHIRE.]

LUDLOW, EDMUND, was born at Maiden Bradley in Wiltshire, about the year 1620. His father was Sir Henry Ludlow, a considerable landed proprietor in that county, and its representative in the Long Parliament. Edmund Ludlow volunteered into Essex's army, and first engaged the king's forces at the battle of Edge-hill (1642). He was one of the most active assistants in Col.

Pride's purge, one of the foremost of the king's judges, and one of the most eager voters for the annihilation of the House of Peers. His independence rendered him obnoxious to Cromwell, who sent him to Ireland with a military command (1650). When Comwell assumed the authority of Protector, Ludlow loudly protested against his elevation, and, if he had been in England, might possibly have impeded it. Consistent in his advocacy of an equal commonwealth, he refused, when he left Ireland, to yield Cromwell an unqualified submission. He was regarded with great jealousy on account of this refusal, and security was required that he should not act in hostility to the government. When the king was restored, Ludlow fled the country. In 1689 he returned to England; but an arrest was threatened, and he was compelled again to fly to Vevay, where he died in 1693, aged about 73 years. His memoirs were first printed at Vevay, two volumes in 1698, and a third in the following year. (Ludlow's *Memoirs.*)

LUDOLPHUS, JOB (the Latinised form of his real name Leutholf), was born at Erfurt, the 15th June, 1624, and was educated at the university of Leyden, where he principally studied jurisprudence and the Oriental languages. During the latter part of his life he resided at Frankfort-on-the-Main, where he died on the 8th April, 1704.

Ludolph was one of the most eminent Oriental scholars of his age, and appears to have been the first European who acquired a knowledge of the Ethiopic language, which he learnt with the assistance of a native of Abyssinia. He published at London, in 1661, a dictionary and grammar of this language; but a much improved edition of the dictionary appeared at Frankfort in 1698, and of the grammar in 1702. Ludolph also paid great attention to the Amharic language, of which he published a dictionary and grammar in 1698. Among the most important of Ludolph's other works are a 'History of Æthiopia' in Latin, Frankfort, 1681, of which there is an English version.

LUGANO. [Ticino.]

LUIGI, ANDRE'A DI, commonly called *L'Ingegno*, and sometimes *Andrea da Assisi*, was born at Assisi about the middle of the 15th century. He was a painter of some eminence, and appears to have assisted Perugino in his works in the Vatican. The only certainly known work by L'Ingegno is a coat of arms for the town-hall of Assisi, where he held various official appointments, amongst others that of papal treasurer under Julius II. The prophets and sibyls in the Cambio at Perugia are assigned to him. There are further attributed to L'Ingegno two pictures in the galleries at Berlin and Vienna, and a Holy Family in the Louvre.

LUINI' or LOVI'NI, BERNARDINO, was born at Luino, on the Lago Maggiore, about the middle of the 15th centry. He is believed to have been the pupil of Lionardo da Vinci. Many of his greatest works, in oil and in fresco, are still in a good state of preservation, in the Ambrosian library at Milan, and in the gallery of the Brera at Milan. There are many easel-pictures in oil by Luini, both in and out of Italy, in public and private collections. Luini's style is something between that of Mantegna and Raphael. He excelled chiefly in painting women and the more delicate exterior expressions of human character. Luini was still living in 1530, but the date of his death is not known. He had two sons, Evangelista and Aurelio, who are both praised by Lomazzo, their contemporary.

LUKE, ST., the Evangelist. Respecting the birth and early life of this evangelist we have no certain information; of his later history we learn something from his own work, the 'Acts of the Apostles.' A considerable knowledge of the Greek language is displayed in his writings, especially in the introduction to his Gospel, which is written in elegant Greek. On the other hand, his language contains many Hebraisms, and he was evidently well acquainted with the religious rites of the Jews, whose mode of computing time he follows. (Luke xxii. 1; Acts ii. 1; xii. 3, 4; xx. 6, 16, &c.) Hence it has been much disputed whether he was a Jew or a Gentile before he embraced Christianity. It was a tradition current in Jerome's time, that Luke was a Greek by birth, but became a proselyte to Judaism early in life. From Col. iv. 14, and from the testimony of Eusebius, Jerome, and other early writers, it appears that Luke was a physician.

The first distinct mention of Luke in the New Testament is in Acts xvi. 10, 11, where, in relating the vision which Paul saw at Troas, the writer suddenly begins to use the first person plural, whence it is inferred that Luke here joined the Apostle (about A.D. 53), whom he accompanied to Philippi (ver. 12). He seems to have remained at Philippi during Paul's journey to Athens and Corinth; for he drops the first person at ver. 17, and does not resume it till he relates Paul's return to Philippi (xx. 5, 6). From this time it appears from the Acts that Luke was Paul's constant companion till his arrival at Rome (about A.D. 61 or 63), where he remained with the Apostle for some time, probably during Paul's first imprisonment. He is mentioned more than once in Paul's Epistles, written during this period. (Col. iv. 14; 2 Tim. iv. 2; Philem. v. 24.) Respecting the end of Luke's life, the tradition is, that, after Paul's liberation from his first imprisonment, he retired to Achaia, where he resided some few years, wrote his Gospel and the Acts of the Apostles, and died at an advanced age (some say 80, others 84 years), probably by a natural death.

LUKE, ST., THE GOSPEL OF, is a narrative of the life of Jesus Christ written by the evangelist Luke, and one of the canonical books of the New Testament. The most probable date of St. Luke's Gospel is about A.D. 63 or 64. It is closely connected with the Acts of the Apostles, and was probably written not long before that book. (Acts, i. 1.) Some writers place it in A.D. 53. Theophylact asserts that it was written fifteen years after Christ's ascension. The common tradition is that it was written in Greece; Jerome says in Achaia and Bœotia.

Like the Acts of the Apostles, this Gospel is dedicated to Theophilus. The conjectures of critics

respecting this personage are as numerous as is usual on such points; the conclusion at which Kuinoel arrives is that he was a converted Gentile, living without the bounds of Palestine. This dedication, the testimony of early writers, and some marks in the work itself, such as the explanation given of matters exclusively Jewish, prove that the Gospel was designed for the benefit of Gentile converts.

LULLY, RAYMUND, surnamed the Enlightened Doctor, an enthusiastic and remarkable character of the 13th century, was born at Palma, in the island of Majorca, in 1234. In early life he followed his paternal profession of arms in the service of the King of Aragon, and abandoned himself to all the licence of a soldier's life. Passing from extreme to extreme, Lully subsequently retired to a desert, where he pursued a life of solitude and rigorous asceticism. Here he pretended to have had visions, and, among others, a manifestation of Christ on the cross, who called him to his service and the conversion of the Mohammedans. Hereupon he divided all his property among the poor; and in his thirtieth year he began to prepare himself, by diligent study, for the labours and duties of a missionary. Learning Arabic from a slave, he read in that language several philosophical works, the perusal of which, in all probability, suggested those new views of grammar and dialectic by means of which he hoped to reform science, and thereby the world itself. Full of this idea, he had a second vision of the Saviour in the semblance of a fiery seraph, by whom he was expressly enjoined to commit to writing and to publish the treatise to which he himself gave the name of 'Ars Lullia,' but which his followers and admirers dignified by the title of the 'Great Art' (Ars Magna). Having besought James of Aragon to establish a monastery in Majorca for the education of thirteen monks in the Arabic language and the duties of missionaries, he went to Rome to seek the countenance of Pope Honorius IV. for similar institutions and his own mission. Receiving however little encouragement, he visited Paris and Genoa with the same design, and with similar success. From Genoa he crossed to Africa, where he was in danger of losing his life in consequence of his dispute with a Mohammedan whom he sought to convert, but was saved by the intercession of an Arabian mufti, on the condition of quitting Africa for ever. This promise however he subsequently considered not to be binding upon him; for, after revisiting Italy, and in vain seeking to excite sympathy and cooperation in his designs, he reassumed, unassisted, his enthusiastic enterprise. Proceeding first to Cyprus, and thence to Africa, he was nearly stoned to death, and, being cast into prison, owed his liberty to the generosity of some Genoese merchants. Upon his return to Europe Lully visited its principal cities, preaching the necessity of a crusade for the recovery of the Holy Land, a plan of which he laid before Pope Clement V., by whom it was received with little or no favour. Unchecked however by so many disappointments, and with the ardour of his enthusiasm still unabated, Lully returned a third time to Africa, where his zeal for conversion entailed upon him dreadful torments, from which he was a second time rescued by the generosity of the Genoese. The sufferings however to which he had been exposed were so great, that Lully died on his passage home, when he was just within sight of his native country, in the year 1315.

The 'Ars Magna Lulli, or the Lullian Art,' which found a few admirers, who styled themselves Lullists, after its inventor, and was subsequently revived and improved by the celebrated Giordano Bruno, is an attempt to give a formal arrangement of all ideas, with a view as well to facilitate instruction as to systematise knowledge. The means which this logical machine employs are:—1, letters (alphabetum artis), which stand for certain general terms common to all sciences, but especially to logic, metaphysics, ethics, and theology; 2, figures, viz., triangles, squares, and circles, which indicate the relations of those general terms; and 3, sections (cameræ), in which the combinations of these ideas or terms are formed by the adjustment of the figures. In the angular spaces of the triangles and squares certain predicates are inscribed, and certain subjects on the circles. On the circle of subjects, the triangles of the predicates being so fixed as to move freely, every possible combination of ideas is supposed to be produced by their revolution, according as the angular points successively pass before the letter inscribed on the margin of the circle. Hence arise definitions, axioms, and propositions, which vary infinitely according to the different application of general or particular predicates to particular or general subjects. As however the ideas which are selected for the fundamental notions of this mechanical logic are purely arbitrary, the knowledge to which it professes to lead must be narrow and limited, and at best it does but furnish a few laws of universal notions for analysis and combination. Nevertheless, as the invention, weak as it is, was founded on a feeling of the inadequacy of the dialectic of the schools, and as it furnished a weapon for its opponents, the name of Raymund Lully has been gratefully placed on the list of the reformers of philosophy. In his personal character he seems to claim more justly our admiration for the iron resolution with which, late in life, and for the most part unassisted, he applied himself to the study of science and philosophy, and for the steady resolution with which he persevered in his scheme of converting the heathen, in despite of all discouragements and disappointment.

The works of Lully have been edited by Salzinger, 'Raymondi Lullii opera omnia,' in 10 vols. fol., Mayence, 1721-42.

LULLY (or LULLI), JEAN BAPTISTE, the father of French dramatic music, was the son of a miller, and born at Florence in 1633. Having attracted the notice of the Chevalier Guise, he was by that nobleman recommended to Mademoiselle de Montpensier, niece of Louis XIV., as a page, and sent to Paris in his fourteenth year. Not being prepossessing in person, he was sent into the kitchen, but his musical talents soon com-

manded the notice of the king, and then he rose quickly in public estimation. When the Académie Royale de Musique was founded, Lully was placed at its head; and his success in this capacity was so great, that he realised a handsome fortune, and was raised to the situation of Secrétaire du Roi.

On the recovery of Louis from a severe operation, Lully composed a 'Te Deum,' and during a rehearsal of it, while beating the time to the band with his cane, he struck his foot a violent blow, and, having put himself into the hands of a quack, his life paid the forfeit of his credulity. He died in Paris, in 1687.

LUMBAGO. [RHEUMATISM.]

LUMBRI'CUS, Earth-Worms, a genus belonging to Cuvier's third order of *Annelids*, and to the first family (*Abranches Sétigères*) of that order.

Cuvier remarks that the *Lumbrici* ought to be subdivided; and Sevigny has in effect established the following genera, viz. *Enterion*, *Hypogdon*, and *Clitellio*. MM. Audouin and Milne Edwards distinguish also the genus *Trophonia*. Savigny described upwards of twenty species, which he regards as being confounded under the ambiguous appellation of *Lumbricus terrestris*. M. Morren, in his 'Treatise on the Natural History and Anatomy of the *Lumbricus terrestris*' (Brussels, 1829), appears to be doubtful with regard to the number of species described by Savigny and others, and inclines to the opinion that they are merely varieties. M. Milne Edwards (edit. of Lamarck's 'Animaux sans Vertèbres,' 1838) considers the characters on which Savigny relied as distinctions for dividing the group into three genera as of little importance.

For an account of the anatomy of the Earth-Worm, the reader will find it useful to consult the 'Catalogue of the Physiological Series of Comparative Anatomy in the Museum of the Royal College of Surgeons in London,' vol. i.; also M. Morren, and others.

The Earth-Worm is not only of great service to the agriculturist in loosening the earth, and rendering it permeable by air and water, but is also a most active agent in adding to the depth of the soil, and in covering comparatively barren tracts with a superficial layer of good mould. See a valuable paper 'On the Formation of Mould, by means of the Earth-Worm,' read before the Geol. Soc. Lond., by C. Darwin, Esq., F.G.S. ('Proc. Geol. Soc. Lond.,' vol. ii. 1837-38). It is probable that every particle of earth in old pasture land has passed through the intestines of worms, and hence in some sense the term 'animal mould' would be more appropriate than 'vegetable mould.' [ANNELIDA.]

LUNACY. Unsoundness of mind is perhaps the most accurate definition of the present legal meaning of lunacy. Formerly a legal distinction was made between lunatics and idiots: a lunatic was one who has had understanding, but has lost the use of his reason; and an idiot, one who has had no understanding from his nativity. The distinction between these two classes of persons of unsound mind also produced some important differences in the management of their property, which have now fallen into disuse. Strictly speaking, perhaps, a lunatic is one who has lucid intervals; but this distinction may also at the present day be disregarded.

Persons of unsound mind may inherit or succeed to land or personal property either by representation, devise, or bequest, but they cannot be executors or administrators, or make a will, or bind themselves by contract. A person of unsound mind, though he afterwards be restored to reason, is not permitted to allege his own insanity in order to make his own act void; for no man is allowed to plead his own disability (13 Vesey, 590), unless he has been imposed upon in consequence of his mental incapacity (2 Carr. & P. 178; 3 Carr. & P. 1, 30); and an action will lie against a lunatic for the supply of necessaries suitable to his station. Acts done during a lucid interval are valid; but the burthen of proving that, at the time when the act was done, the party was sane and conscious of his proceedings, lies upon the person asserting this fact. The marriage of a person of unsound mind, except it be solemnised during a lucid interval, is void.

As a general rule, it may be laid down, that where unsoundness of mind, of such a nature as to render the party incompetent to exercise any self-control, is established, criminal punishment will not be inflicted; but that he will be kept in safe custody during the pleasure of the crown (39 & 40 Geo. III. c. 94, and 1 & 2 Vict. c. 14). On the subject of criminal responsibility, and what constitutes unsoundness of mind in a legal point of view, the reader is referred to the various treatises on medical jurisprudence, particularly to that by Dr. Ray, published at Boston, in the United States: and also generally to Dr. Haslam's 'Observations on Madness and Melancholy,' 'Medical Jurisprudence as it relates to Insanity,' 'Illustrations of Madness,' and his other works. Dr. Forbes Winslow on 'The Plea of Insanity in Criminal Cases' is a valuable book.

In an inquisition of lunacy the question to be decided is, not whether the individual be actually of sound mind, though a jury on an inquisition held under a commission of lunacy must express their opinion or finding in the form that the alleged lunatic is of unsound mind ('In re Holmes,' 1 Russell, 182); but, though such must be the finding in order to make a man legally a lunatic, the real question is whether or not the departure from the state of sanity be of such a nature as to justify the confinement of the individual, and the imposition of restraint upon him as regards the disposal of his property. In all such inquiries it should be kept in mind that insanity varies infinitely in its forms and degrees. Persons may be of weak mind and eccentric, and even be the subjects of delusions on certain subjects, and yet both inoffensive and capable of managing pecuniary matters. The individual's natural character should be taken into consideration as accounting for eccentricities of manner and temper, and his education in estimating his ignorance and apparent want of intellect; and, lastly, due allowance must be made for the irritation and excitement pro-

duced in a mind, perhaps naturally weak, by the inquiry itself, and the attempt to deprive a man of his liberty and the management of his property.

A lunatic is responsible for acts committed during 'lucid intervals,' a term by which is understood however, not mere remissions of the violence of the disease, but periods during which the mind resumes its perfectly sane condition. In forming an opinion concerning such lucid intervals, the absence of the signs of insanity must have considerable duration before it can be concluded that the mind is perfectly sane; for lunatics, when apparently convalescent, are subject to sudden and violent paroxysms.

One of the most difficult points to be determined is with regard to the mental capacity of old persons, in whom the mind is impaired. The decay of intellect in old age is first manifested in the loss of memory of persons, things, and dates, and particularly with respect to recent impressions. But it is not the mere liability to forget names, and such matters, which will render the will of an old person invalid; it should be shown that in conversation about his affairs, and his friends and relations, he did not evince sufficient knowledge to dispose of his property with sound judgment. Many old men appear stupid and forgetful; but, when their attention is fairly fixed on their property, business, and family affairs, they understand them perfectly, and display sagacity in their remarks.

The care and custody of idiots and lunatics form a branch of the royal prerogative, and were formerly administered by the king himself. Since the dissolution of the Court of Wards, the lord-chancellor has been specially appointed to exercise this power. The method of proving a person to be of unsound mind, for the purpose of depriving him of the control of his property, and, where the circumstances require it, providing for the safe custody of his person, is by the inquisition of a jury, summoned under a commission granted by the lord-chancellor. If the fact of lunacy be established, the care of the lunatic is committed to some fit person, and the care of his estate either to the same or to some other fit person.

Some recent acts have made alterations in the proceedings under commissions of lunacy.

An act of the 3 & 4 Wm. IV. c. 36, is entitled 'An Act to diminish the Inconveniences and Expenses of Commissions in the Nature of Writs de Lunatico Inquirendo; and to provide for the better Care and Treatment of Idiots, Lunatics, and Persons of Unsound Mind, found such by Inquisition.'

An act of the 5 & 6 Vict. c. 84, is entitled 'An Act to alter and amend the Practice and Course of Proceeding under Commissions in the Nature of Writs De Lunatico Inquirendo.' The first section empowers the lord-chancellor to appoint two serjeants or barristers-at-law, to be called 'The Commissioners in Lunacy,' and enacts that in future all Commissions in the nature of writs De Lunatico Inquirendo shall be directed to such Commissioners, and that such Commissioners shall jointly and severally have and execute all the powers, duties, and authorities now had and executed by commissioners named in commissions in the nature of writs De Lunatico Inquirendo.

By the 8 & 9 Vict. c. 100, s. 2, the two commissioners of lunacy are henceforth to be called Masters in Lunacy, and take the same rank and precedence as the masters in ordinary of the High Court of Chancery. Some other regulations as to the duties of the masters in lunacy are contained in 8 & 9 Vict. c. 100, s. 95–98. The other sections of the Act 5 & 6 Vict. c. 84, make regulations as to fees and other matters, for which the act must be consulted.

The term lunatic is only properly applied to a person who is found to be a lunatic by the verdict of a jury under an inquisition. But the term lunatic is also applied to those who, being considered lunatics, are confined in lunatic asylums or hospitals, under such regulations as the 8 & 9 Vict. c. 100, s. 44–49, prescribe, without having been found lunatics under an inquisition; and also to any single patient who is boarded or lodged for pay as a lunatic in a house not licensed under the act (s. 90); and also to any person who is under the care of any person who receives or takes the charge of such one lunatic only, and derives no profit from the charge (s. 112). As to the persons and property of such so-called lunatics, who have not been found lunatic by a jury, the 8 & 9 Vict. c. 100, s. 94, &c., has various provisions.

In the Roman system, persons of unsound mind (furiosi) might be deprived of the management of their property on application to the prætor by his next of kin. This legislation was either introduced or established by the Twelve Tables. The person who had the care of the lunatic and of his property was called a curator. The Twelve Tables gave the care of the lunatic to his agnati. In those cases where the law had not provided for the appointment of a curator, the prætor named one. ('Dig.' 27, tit. 10; 'Instit.' 1, tit. 23.)

LUNAR OBSERVATION generally means an observation of the moon's distance from a star, for the purpose of finding the longitude.

LUNAR THEORY. By the theory of a planet is meant the deduction of its motion from the law of gravitation.

LUNATIC ASYLUMS. The subject of insanity and asylums for the insane has of late years occupied a very large share of public attention, particularly as an opinion has prevailed that insanity is on the increase in this kingdom beyond the ratio of population. The want of accurate information renders this point doubtful; but it is certain that more than 20,000 insane persons are in confinement in the public asylums and licensed houses in England and Wales, of whom 16,000 are paupers. But as a great number of patients are confined separately, or in the care of their relatives, of whom no public returns are made, this number is probably much underrated.

Two acts passed in 1845 (8 & 9 Vict. caps. 100 and 126) have placed the powers vested in the Commissioners in Lunacy on an entirely new footing, and have in many respects modified the con-

stitution of asylums. The first act repeals 2 & 3 W. IV. c. 107; 3 & 4 W. IV. c. 64; 5 & 6 W. IV. c. 22; 1 & 2 Vict. c. 73; 5 Vict. c. 4; and 5 & 6 Vict. c. 87. This first act appoints six commissioners, three of whom are physicians, and three barristers, with salaries; and five other commissioners, who act gratuitously. The rule that none of these shall be connected with any asylum is continued. Licences to receive lunatic patients are granted by these commissioners at each of their quarterly meetings. No licence is to remain in force more than thirteen months, and the notice of a wish to renew must give the number of patients then confined. The jurisdiction of the commissioners extends to the whole of London and Middlesex, and Southwark, and to all places within seven miles of London, Westminster, and Southwark: in the country the licences are to be granted by the justices of the peace in quarter-session, who are bound to appoint three of their number, together with one physician, surgeon, or apothecary, as visitors of the asylums licensed by them. Strict regulations are enforced for the reception of patients; it is required that every person not being a pauper, received as insane, shall be certified to be so by two physicians or surgeons, who shall visit such patient separately, and shall have no interest in the asylum in which such patient is to be confined; and certain entries of these particulars are to be kept at each asylum. For a pauper the certificate of one medical man and the order of two justices is required.

Penalties are fixed for neglecting these rules, or those which direct notice to be given of every admission, death, discharge, or escape. Houses having 100 or more patients are to have a resident medical attendant, and those of smaller size are to be visited by a medical attendant at defined periods, according to their size. Every house within the immediate jurisdiction of the commissioners shall be visited by them at least four times in the year, and every other house at least twice in every year. Similar powers are given to the visitors in the country.

The commissioners are to present an annual report to the lord-chancellor of the state of the different asylums visited by them, which Report shall be laid before parliament.

An important alteration is made in the law concerning the care of single patients. Orders and medical certificates must in future be procured for the care of one patient similar to those used for the admission of patients into licensed houses; and copies of these documents are to be privately sent to and registered by the secretary to the commissioners. This act only extends to England and Wales, and it does not affect Bethlem Hospital, London. The persons appointed to hold commissions 'De Lunatico Inquirendo,' heretofore styled commissioners, are in future to be termed 'Masters in Lunacy.'

The second act, which repeals 9 Geo. IV. c. 40, relates to the regulation of lunatic asylums for counties and boroughs, and the maintenance and care of pauper lunatics, and gives to the commissioners a greater power over these institutions, which had previously been entirely under the control of justices of the peace. The justices of every county and borough are now to be compelled to erect or to join in the erection of an asylum when none such already exists; and all proposals, agreements, and plans, and the rules and regulations of each asylum, are to be submitted to the commissioners, and all contracts and estimates approved by the secretary of state. Contracts for the care of insane persons in licensed houses do not exempt any county or borough from the obligation of providing an asylum. Power is given to committees to grant retiring allowances to the officers of asylums; and a medical officer must be resident in every asylum which contains more than 100 patients. Lists of all the patients are to be sent twice in every year to the commissioners by the medical officer. This act extends only to England and Wales, and does not apply to Bethlem Hospital.

The patients who are confined in prisons, hospitals, workhouses, or in the houses of their relatives, are exposed perhaps more than any others to great neglect and mismanagement, and not unfrequently are treated with great cruelty, even when the intentions of the parties who have charge of them are good, through their entire ignorance of the nature and proper treatment of the disorder. The provisions of these acts will doubtless contribute to the better management of all such establishments.

Management of Public Asylums.—There is considerable diversity in the internal regulations of different public asylums as to the power and position of the medical and non-medical officers. In some there is a resident physician who holds the supreme authority, and is also steward and general manager; in others the physician only presides in his own department; and in others the chief officer is not medical, and the physician is non-resident.

In all asylums the position of the matron is one which requires to be settled in some uniform manner: owing to the matron having been in many cases the wife of the superintendent, an undue importance has been given to her position; the appointment of the female attendants, and even the classification of the female patients, has sometimes been left in her hands. In the French asylums there is no matron: a few of the most experienced female attendants act as heads of departments, and receive the orders of the medical officers; and this arrangement, which is found to work exceedingly well at the Salpétrière, where there are 1500 female patients, seems on the whole to be the best. The effect of placing the matron in a higher position is almost certainly to bring about interference on her part with the duties of the medical officers, which cannot fail to be injurious to the welfare of the patients.

In the appointment of a chaplain, steward, secretary, accountant, and any other officers, the most important point is to confine their duties within certain proper limits, and to prevent their interference with the patients without the concurrence of the medical officers.

There should be in each asylum one resident medical officer, responsible for the entire conduct of

the asylum. At Glasgow the whole authority has for some years been in the hands of the resident physician, with the most satisfactory results; and an approximation is made to this plan in the Irish district asylums, where the non-resident physician is the principal officer.

By the acts lately passed, the power which the justices who had the control of different asylums possessed of passing rules at any meeting which entirely changed the system of management, or of summarily dismissing any officer, is done away with.

A great improvement has been made of late years in the class of persons appointed as attendants, or, according to the old phraseology, *keepers*. The proportion of attendants to patients in the different English public asylums varies, from one to ten to one to twenty. No ward, however small, should have less than two attendants, in order that it should never be left; this is enforced by the rules of several asylums. A large number of attendants renders a vigilant superintendence by night practicable, which is no less important than by day, although it is entirely omitted in some institutions.

Every part of the treatment of the insane has of late years been much modified by the introduction of a much milder mode of management. The total abolition of personal coercion, known as *the non-restraint system*, was first introduced at the Lincoln Asylum in 1837, and its complete success there led to its adoption at Hanwell in 1839, and shortly afterwards at Northampton, Gloucester, Lancaster, Stafford, and Glasgow. This system has since been adopted at Haslar Hospital, and also at Armagh, Londonderry, and Maryborough; and very little restraint is used at the other Irish district asylums. The asylums which do not agree to the disuse of restraint as a principle have effected it in practice, with very few exceptions. Since the year 1792, when Pinel struck off the chains of the patients at the Bicêtre, a gradual improvement has been going on in the treatment of these the most unfortunate of human beings; but the declaration, that mechanical restraints were 'never necessary, never justifiable, and always injurious,' made by Mr. Hill of Lincoln, has caused this march of improvement to proceed much more rapidly. The reports of the asylums in which the new system has been introduced, especially those of Hanwell, give all particulars as to the mode of management substituted for coercion.

However opinions may differ as to the abolition of restraint in those asylums which have not tried the experiment, we know that many thousand patients have been treated entirely without it; that in no asylum where the new system has been introduced has it been found necessary to abandon it; that the reports of all these asylums state their general condition to be improved; that the cures have not decreased; and, which we consider of equal importance, that the comfort of the incurables is much increased: and we may therefore be justified in considering that within a few years the instruments of restraint now remaining in use will disappear like those much more severe ones which preceded them.

Construction.—The site and construction of an asylum for the insane are matters of great importance. A healthy and cheerful situation should be the first consideration in an institution intended for the cure of diseased minds. In this respect some existing asylums are very well placed; Hanwell, Lincoln, and Surrey may be instanced. Others have been originally on the outskirts of towns, and have been surrounded and built in by the increase of building.

A building ought not to be larger than to accommodate 300 or 400 patients. As to plan, no two of the existing asylums are alike, and the most recently erected are by no means the best. In the Surrey Asylum a complete copy has been made of the worst and newest part of Hanwell, in which the bed-rooms face one another, and the galleries are lighted from the top, which renders proper ventilation impossible. To make wide galleries, with rooms only on one side, would certainly increase the cost of the building; but, by introducing a bow or expansion into each gallery, the necessity for a day-room will be done away with. An open fire should be in each of these expansions; it will be a great source of comfort to the patients, and an improvement in the ventilation as well as the general appearance of the gallery, and with a light wire guard is perfectly safe. No ward should contain more than thirty patients; and of these from twenty to twenty-five ought to have single rooms. It is matter of regret to find that dormitories are approved by the commissioners, and supported by the officers of some asylums; they certainly lessen the cost of building, but the quiet and comfort of the institution must be much diminished. Their ventilation is also very difficult. For the sick, the violent, the dirty, and the noisy, single rooms are obviously necessary; and it will, we believe, generally be found that the remaining patients, those whose tranquillity and usefulness entitle them to indulgences, will consider a single room, which they can call their own, one of the greatest that can be given them.

An asylum containing 400 patients may probably be built in a straight line, which is desirable, without the necessity of carrying it higher than the first floor. The chapel and chief officers' rooms, and the rooms used for the work or amusement of the patients, should form the centre; behind which the kitchen may be conveniently placed, with the laundry on the side next the wards of the women, and the workshops on that of the men. In the wards branching off from the centre, those patients who are quiet and convalescent and the sick should be placed, and the most refractory at the extreme ends of the building, to prevent them from disturbing the others. Six classes of patients may usually be formed for each of which some modification of management will be required.

All the sick, idiots, and epileptics, should be on the ground-floor, which will be easily arranged, as the tranquil and moderately tranquil, who form the great bulk of the patients, may occupy the upper floor.

An abundant supply of warm and cold water should be secured; or in some cases it will be found that the cost of supplying this necessary

article will neutralise the advantages of an otherwise favourable site.

Baths, water-closets, a store-room, and rooms for washing are essential in every ward. Warm baths are considered valuable remedial agents, as well as advantageous to the general bodily health.

The Commissioners have expressed an opinion that incurable paupers may be accommodated in asylums apart from the curable at a much less expense, and an arrangement for a separate provision for incurables is required by the new act (s. 27); but they cannot be aware that, while the incurables comprise all the most tranquil and intelligent of the patients, whose society is of great value to the curables, they also comprehend patients who display every different form of insanity, and require every variety of treatment. It is certainly much to be wished that provision could be immediately made for all insane paupers; but we cannot consider that the removal of all hope from a large number of them, by immuring them in an 'asylum for incurables,' would be the best mode of attaining this object.

Statistics.—There are in England and Wales 12 county asylums, 5 county and subscription, 11 partly subscription and partly charitable, 1 military, 1 naval, and 142 licensed houses; 14 of which last receive paupers. The hospital of Bethlem, which is exempt from the rules that affect other asylums, is to be added to this number.

Scotland has 8 public asylums; in all of which, we believe, private patients as well as paupers are received; and some are assisted by charitable endowments.

Ireland has 12 public asylums; 10 of these are district asylums for the poor; Cork is locally governed, and Swift's Hospital is founded by charter.

Several new asylums are in progress both in England and Ireland.

LUNATION, the time between two new moons. [Moon.]

LUND. [Sweden.]

LUNDY ISLAND. [Devonshire.]

LUNE, LUNULE, the figure formed on a sphere or on a plane by two arcs of circles which inclose a space.

LÜNEBURG, a province of Hanover, situated between 52° 15′ and 53° 30′ N. lat., 9° 16′ and 11° 40′ E. long., is bounded N. by the Elbe, which separates it from Holstein, Hamburg, and Lauenburg; N.E. by Mecklenburg-Schwerin and Prussia; E. by Saxony; S.E. and S. by Brunswick and Hildesheim; and W. by Calenberg. The area is 4326 square miles, and the population in 1845 was 323,879. The country is an immense sandy plain, broken by chains of low hills. The surface is chiefly covered with heath, extensive turf moors, and forest woods, mostly of fir. Fertile arable land is rare; but on the banks of most of the rivers, especially the Elbe and the Aller, there is very rich marsh land. The principal river is the Elbe, which runs along the frontier, and receives several small feeders in this province. The Aller, in the south of the province, belongs to the valley of the Weser. The country has a very gradual fall towards the Elbe and the Weser, especially towards the former, against the inundation of which the land is secured by dikes. The highest land between the two rivers is the Lüneburg Heath. This tract has some villages and seats of rich landowners on the small streams that run through it. A breed of small coarse-woolled sheep is kept on this heath. The villagers derive their chief subsistence from tending bees and gathering bilberries, juniper-berries, and cranberries, of which vast quantities are sent to Hamburg and Bremen. The quantity of corn raised is not sufficient for the population. Flax is extensively cultivated. The land produces also hops, potatoes, garden vegetables, and turnips in abundance, but only a little fruit. The breeding of cattle is more profitable than tillage; the sheep are very numerous, but their wool is in general indifferent. The breed of horses has been lately improved. The manufactures are confined to articles of common household use.

Lüneburg, the capital, is situated in 53° 15′ N. lat., 10° 17′ E. long., on the Ilmenau, which is here navigable about 15 miles above its junction with the Elbe, and has 13,000 inhabitants. It was formerly surrounded with walls, but the fortifications are now dismantled. The principal buildings and public institutions are the royal palace, the gymnasium, St. Michael's church, in the vaults of which are the monuments of the ancient princes, the convent of St. Michael, the town-hall, the arsenal, hospital, &c. The inhabitants carry on a considerable trade in the products of the country, such as linen, salt, wax, honey, woollens, linen thread, flax, horses, of which 70,000 are annually brought hither to market, &c. There are very productive saltworks in a part of the city which is separated from the rest by a wall, and is called the Sulze. Great quantities of lime are burned in the Kalkberg, a hill near the town, and sent to Hamburg and Holland. There are manufactories of soap, breweries, distilleries, a paper-mill, &c. Of the other towns in the province the most important is *Celle* or *Zell*, a tolerably well-built town, at the junction of the Fuse and the Aller, the seat of the supreme court of appeal; it has a gymnasium, a national stud, a large house of correction, six churches, and 11,000 inhabitants. In the suburbs, which are very extensive, there is a palace with a large garden, in which Matilda, sister of George III., is buried. *Harburg*, on the Elbe, opposite Hamburg, has linen and woollen factories, a powder-mill, tanneries, wax-bleaching, and stocking-weaving establishments, sugar refineries, and a great trade in timber. Population, 5000. *Uelzen in the Heath*, on the Ilmenau, has 3000 inhabitants, who grow flax, and manufacture woollen cloth, camlets, and starch.

LUNEL. [He'rault.]

LUNETTE, in Fortification, is a work similar to a ravelin, or demi-lune, but generally of smaller dimensions. Its position may be understood by conceiving it to be placed beyond the glacis S S [see Fig. in Article Fortification] on lines passing through P and Z, or X and R, and produced.

Each lunette is protected in front by a ditch, beyond which is a covered-way, as usual.

To give the more advanced lunettes, which are generally those placed beyond the ravelins, all the advantages of which they are susceptible, the magistral lines of their faces should coincide with the sides of an equilateral triangle whose base is a line joining the faces of the two collateral bastions at points about twenty or thirty yards from their flanked angles; for thus the ditches before the faces of the work can he defended by two or more pieces of artillery conveniently placed on the faces of the bastions. The ditches of the retired lunettes should in like manner be defended by artillery placed on the faces of the collateral ravelins. This rule for placing the advanced lunette will permit the ditch and covered-way of the latter to be defended by a fire of musketry from the retired places of arms L L [FORTIFICATION], and from the covered-way before the bastion; and, that such fire may graze the bottom of the ditch of the lunette, this ditch ought to be in an inclined plane nearly coinciding with the slope of the glacis S S.

Advanced lunettes about a fortress form strong posts for artillery, by which an enemy is compelled to commence his approaches at a greater distance than would otherwise be necessary. The length of their faces may be from sixty to seventy yards, and that of their flanks from fifteen to twenty. The rampart should have the same height above the natural ground as is given to that of the ravelins. It is considered that a well-disposed series of these works would prolong the defence of a place about ten or twelve days. But they are only proper for fortresses of the first magnitude, since they would require a large garrison; and the troops, on being compelled to retire, might not find sufficient room in a small place.

LUNÉVILLE, a town in the French department of Meurthe, stands in 48° 35′ 35″ N. lat., 6° 29′ E. long., at a distance of 180 miles E. from Paris, on the Vezouze, a feeder of the Meurthe, and has a tribunal of first instance, a college, and 16,418 inhabitants. Léopold, Duke of Lorraine, resided here, and built a palace, which was subsequently much improved by Stanislas, Ex-King of Poland. Both of these princes made great improvements in the town, which presents wide, straight, and well-built streets, and some handsome squares. Behind the palace is the parade-ground or Champ de Mars, which covers a space of 500 acres. The other remarkable objects in Luneville are the parish church, the immense cavalry barracks, with stabling for 6000 horses, the riding-school, which is considered the finest in France, being large enough for 200 horse soldiers to exercise in, the hospitals, and the Place Neuve, which is ornamented with handsome buildings. Great bodies of cavalry are frequently collected to Luneville in the autumn for the purpose of manœuvring on a large scale. The town has manufactures of woollen cloth, calico, hosiery, lace, gloves, earthenware, sheet iron, and beer; it has also a good trade in wine, corn, brandy, hemp, flax, wood, &c. By the treaty of peace signed at Lunéville, Feb. 9, 1801, the Rhine was made the limit between France and Germany.

LUNGS. [RESPIRATION.]

LUNGS, DISEASES OF THE. The highly organised structure of the lungs and the incessant exercise of their important function, frequently, under noxious circumstances, render these organs perhaps the most liable to disease of any in the body. Exposure to damp and cold, sudden atmospherical changes and transitions of temperature, want of proper nourishment, inattention to personal cleanliness, and some of the mechanical employments in which the confined and heated atmosphere of workshops is impregnated with minute particles of foreign substances, such as steel, wool, &c., may be considered as among the chief exciting causes of this extensively prevailing class of diseases. The diseases of the lungs may be conveniently divided into acute and chronic.

In inflammation of the lungs (*pneumonia peripneumonia*) the air-cells and parenchymatous structure of the organ are the seat of the disease. It is generally ushered in by rigors, and attended subsequently by great fever. There is much difficulty of breathing, and the respirations, which in the natural state are about 20 in a minute, increase in frequency to about 40 or 60. Sometimes there is little cough throughout the disease, but most commonly it increases as the disease advances, and the sputa become more deeply tinged with blood. The features subsequently assume a livid appearance; the breathing gets more oppressed; expectoration is effected with difficulty; the powers of life fail, and the patient dies from the lungs being no longer able to carry on their function.

In the early stage of pneumonia the inflamed part acquires an unnatural density and heaviness from the unusual accumulation of blood in it, but it still crepitates on being grasped. In a more advanced state, the lung is found still more dense, and does not crepitate when squeezed, showing that air is no longer admitted. As in this condition it somewhat resembles liver, it has been termed the stage of hepatisation. When the disease has proceeded still further, suppuration may be found to have taken place. The sounds given by the stethoscope are crepitation in the first stage, and an absence of sound in the second. Percussion is dull in both stages.

The treatment of inflammation of the lungs must be conducted on the same general principles as inflammation occurring in any other part. The important nature of the organ renders it necessary to resort promptly to bleeding, sometimes to a very large amount, and on repeated occasions. Antimonials and mercury are also highly useful in this affection.

Inflammation is sometimes confined to the bronchial tubes, and is called bronchitis; it may also co-exist with pneumonia. [BRONCHITIS.]

Mortification or gangrene of the lungs, though sometimes occurring as a result of pneumonia, most frequently takes place as an independent affection. Great fetor of the breath, with an expectoration of dark brown, greenish, and fetid sputa, excessive debility, and a cadaverous expression of countenance, are the symptoms by which it is indicated. After death portions of lung are

found in a partially decomposed state of a dark brown or dingy greenish appearance, with a putrid smell.

Hæmoptysis, or Spitting of Blood. Expectoration of blood may occur either by exhalation from the mucous membrane of the air-tubes or from the lesion of a blood-vessel. It generally occurs in early life, from the age of fifteen to thirty-five, and in the former instance may be dependent upon local congestion. This determination of blood to the lungs may be occasioned by the sudden suppression of some natural or accidental discharge from other parts, as in suppressed or impaired menstruation, or the arrest of an hæmorrhoidal discharge, or by pressure of tuberculous matter. From the latter cause it is frequently a sign of approaching consumption. The expectoration of the blood is attended with cough. Sometimes the quantity brought up is very considerable, and is expelled with violence; at other times the sputa are only streaked with it. The expectorated blood is generally of a vermilion colour, and, when in small quantities, it is frothy and mixed with air. When the blood comes from the stomach, it is brought up by vomiting and without cough, without the frothy appearance, and is of a dark grumous character.

Pulmonary apoplexy occurs when blood is effused into the parenchymatous structure of the lungs.

Malignant Diseases.—The lungs are also subject to diseases of a specifically malignant nature, such as medullary sarcoma and melanosis; but these rarely occur as a primary affection. The medullary and melanoid matter is deposited in these organs as a secondary affection, in conjunction with its existence in other parts, and frequently in all or the majority of the organs of the body.

The most fatal of all the diseases of the lungs is treated of under PHTHISIS PULMONALIS. Inflammation of the Pleura is treated of under PLEURISY.

LUPINITE, a peculiar bitter substance, extracted from the leaves of the *Lupinus albus;* it has a green colour, is translucent, and may be melted.

LUPI'NUS, a very extensive genus of hardy annual, perennial, and half-shrubby plants, commonly cultivated in gardens for the sake of their gaily coloured flowers. The species inhabit Europe, the basin of the Mediterranean, and the temperate parts of both North and South America, especially of the former, where they are extremely abundant; but they are unknown in a wild state throughout all the tropics, except on mountains, and in the principal part of Asia, New Holland, and South Africa.

LUPULIN, a substance extracted from hops, and containing from 8 to 12 per cent. of the vegetable matter to which hops owe their power, and to which the name of *lupulite* has been given.

LUPULITE is nearly colourless, but sometimes of an orange colour: in the former case it is opaque, but in the latter transparent; it has no smell till it is heated, and then it has the odour of hops; its taste is bitter.

LUPUS (the Wolf), one of the old constellations, named in Aratus and Ptolemy simply Θήριον, 'the wild beast.' It was not a separate constellation, but was carried in the right hand of the Centaur towards the Altar. The same description is given by Hyginus. In modern maps it is represented as a wolf transfixed by the spear of the Centaur. It is situated between Centaurus and Ara, directly under Scorpius.

LURE. [SAÔNE, HAUTE.]

LURGAN. [ARMAGH.]

LUSATIA. [LAUSITZ.]

LUS. [BELOOCHISTAN.]

LUSIGNAN. [CYPRUS; VIENNE.]

LUSITANIA. [PORTUGAL.]

LUSTRUM was the name applied to a period of five solar years among the Romans; and the termination of this period was generally marked by great religious solemnities. Varro derives the word from *luere*, because the farmers paid their taxes at that time; but others, with more probability, trace the etymology to the purifying sacrifice which was then offered.

It is well known that the most ancient Roman year consisted only of 10 months, or 304 days, and that this year continued to be used for religious purposes. Niebuhr, in his 'History of Rome,' has shown that the *lustrum* was the period after which the beginnings of the civil and religious years were made to coincide; since 5 solar or civil years of 365 days each, containing 1825 days, coincide with 6 religious years of 304 days each, containing 1824 days, with the difference of one day.

LUTE, a musical stringed instrument with frets, one of the numerous varieties of the ancient *Cithara*. Till towards the end of the 17th century its practice formed an essential part of a good education, but it has since been partially superseded by the guitar. Mersenne, in his 'Harmonie Universelle' (1636), describes the lute as consisting of three parts: the table, made of fir; the body or belly, of the same wood or cedar, constructed of nine convex ribs joined; and the neck, on which was fixed the finger-board, of hard wood, having nine frets made of catgut. To these is to be added the head or cross, in which the pegs or screws were placed. The lute had at first six strings, or rather eleven, for the five largest were doubled; but the number was gradually increased till it reached twenty-four.

LUTES, in chemistry, are substances employed in various operations for closing the joints of apparatus, and especially for connecting retorts and receivers so as to prevent the escape either of the vapour or gases generated during distillation or sublimation. The term lute is also applied to the external coating of clay and sand, or other substances applied to glass retorts, in order that they may support a high temperature without fusing or cracking. Common plastic clay answers sufficiently well in some cases, but in some small distillations, as of nitric acid, the Fat Lute is used, which is prepared by mixing dried and powdered pipe-clay into a paste with linseed oil; and the joint is further secured, both where this lute is used and in many other cases, by tying it over with moistened bladder. In luting common

stills, in which oils or water are merely distilled, linseed meal and water, made into a paste, form an effectual lute.

In luting, or rather coating, glass retorts, in order to enable them to sustain high temperatures, Stourbridge clay or Windsor loam mixed with tow have been used; but they require long drying, and are apt to crack. The simplest mode is that of brushing the retort over with a paste of pipe-clay and water, sifting sand upon it, drying it quickly in the ash-pit of the sand-heat, then covering it again with clay and sand, and repeating the alternate applications and drying till the coating is judged sufficiently thick.

LUTHER, LUDER, or LOTHER, MARTIN, born at Eisleben in Saxony, in November 1483, was the son of Hans Luther, a miner and a worker in metals, who was a native of Eisenach. Young Martin was first sent to the school of Eisenach, and in 1501 he went to the university of Erfurt. Luther applied himself to literature and music, which latter he continued to cultivate during the rest of his life. While at Erfurt, he appears to have exhibited the usual jovial careless disposition of a German student. In 1505 an accident occurred which altered the current of his thoughts. One of his fellow-students was killed at his side by lightning, and Luther from that moment made a vow to become a monk. In July of the same year he entered the Augustine convent at Erfurt, carrying with him only a Virgil and a Plautus. In 1508 Luther was appointed professor of philosophy in the university of Wittenberg. In 1510 he was sent by his superiors to Italy on business concerning the order, —a circumstance which brought about a crisis in Luther's life. He found pomp and pride, gross sensuality, hypocrisy, and treachery, as he tells us, where he expected to find all the Christian virtues. When Luther arrived at Rome the warlike Julius II. was busy about his schemes of humbling Venice and driving the French out of Italy. His cardinals were better acquainted with Cicero than with the Bible. Luther remained only a fortnight at Rome, and hurried back to Germany with his religious belief greatly shaken. In 1512 Luther was made doctor of divinity, and Frederic, elector of Saxony, called the Wise, defrayed the expense of his inauguration. In 1517 Pope Leo authorised by a bull the sale of indulgences in Saxony and other parts of Germany. Luther, who was then professor of theology at Wittenberg, was shocked at this impious system. Some of his penitents, who had purchased the indulgences, refused to submit to the penance or reparation which he enjoined. Luther having refused absolution, they went and complained to Tetzel, the Pope's quæstor, who threatened with both spiritual and temporal punishments all those who denied the efficacy of his indulgences. Luther, little heeding the threats of the Dominican, drew up his well-known ninety-five theses or propositions concerning indulgences. He inclosed a copy of his propositions to the Archbishop of Magdeberg, dated October 31, 1517, beseeching that prelate to interpose to prevent the further spreading of error, and to put a stop to Tetzel's scandalous practices. On the same day Luther affixed another copy of his theses on the gates of the Castle church of Wittenberg, signed with his name, and containing his offer to defend them. His theses spread with the greatest rapidity; and the main principle upon which they rested, namely, that indulgences could only remit the canonical or temporal penalty, gained ground universally throughout Germany.

In 1518 Luther, at the command of the Pope, submitted to an examination by Cardinal Caietano, which ended in confirming both parties in their respective opinions. On November 28, in the same year, Luther appealed from the Pope to a general council of the church.

Leo commissioned a new legate, named Miltitz, to bring Luther to a reconciliation. Miltitz had a conference with Luther at Altenburg, in the beginning of 1519, in which he agreed with Luther in condemning the abuse made by Tetzel of the indulgences, and so far conciliated his antagonist as to induce him to write a submissive letter to Leo, dated March 13, 1519, in which Luther acknowledged that he had carried his zeal and animosity too far, and he promised to observe in future a profound silence upon the matter in debate, provided his adversaries would observe an equal temperance; further protesting that he never meant to deny the power of the Pope, which was inferior only to that of Christ, and that he would always exhort the people to honour the Roman see. 'This letter,' says Beausobre, 'is a sad monument of human weakness.' Then followed Luther's celebrated disputations with Eckius, in the course of which Luther published his works 'On Babylonian Captivity,' 'On Christian Liberty,' &c., in which he openly attacked the doctrines and the authority of the Church of Rome. Being condemned as a heretic, and called upon in vain by the Pope to confess and retract, he was excommunicated, and his works were burnt: he on the other hand publicly destroyed the Pope's bull at Wittenberg, before an immense multitude.

Luther, having separated from Rome, wrote several vehement pamphlets against the Pope, whom he openly styled Antichrist. At the same time Leo urged the new emperor, Charles V., to punish Luther as a heretic. But Frederic, the elector of Saxony, employed his influence with Charles to have Luther's cause tried by a diet of the empire, which assembled at Worms, in April, 1521.

Luther repaired to Worms, and was met by multitudes outside the town. On entering, he began singing the hymn, 'Our God is a strong Citadel,' which became known as Luther's hymn, and the inspiring song of the Reformation. Being called upon to retract his writings, he answered, that, if convicted by the testimony of the Scriptures, he was ready to burn them, but not otherwise. He was finally dismissed, though, as the emperor asserted, he was to be treated as a heretic. A month after his departure, an imperial edict placed Luther under the ban of the empire, ordering him to be seized and retained in prison at the emperor's pleasure, and imprisonment and

confiscation were denounced against any one who aided and abetted him. But the edict could not be enforced. The Elector of Saxony was Luther's friend. His writings spread and produced a wonderful effect in Saxony. Hundreds of monks quitted their convents, and married. The Austin friars of Wittenberg abolished the mass. Carlostadt, a disciple of Luther, proposed to banish all books from the university except the Bible. To stay this fanaticism, Luther returned to Wittenberg (1522). He rebuked Carlostadt, who was banished from Saxony as a seditious person by the elector.

Luther was now the acknowledged leader of the reformers of Germany. At the close of 1522 he published his German version of the New Testament. In 1523 he preached against the mass. In 1524 Luther threw off his monastic dress, and definitively condemned monastic institutions. Convents, both of men and women, were now rapidly suppressed throughout North Germany, and their property was seized by the secular power; and the fanaticism that for a time prevailed led to many excesses, at which Luther sorely grieved.

In 1525 Luther married Catherine de Bora, a young nun who had left her convent the year before. He had long before condemned the obligation of clerical celibacy, as well as that resulting from monastic vows. 'Marriage in its purity,' he wrote, 'is a state of simplicity and peace.' Besides the Elector of Saxony, the Elector Palatine, the Landgrave of Hesse, the Duke of Deux Ponts, the Margrave of Brandenburg, and Grand-master of Prussia, and also many cities in other parts of the empire, embraced Luther's reformation.

In March 1529, the Catholics endeavoured to enforce the edict of Worms; but the reformed princes delivered a formal 'protestation' against this decree: from this protestation arose the name of Protestants.

In 1530 a diet was convoked at Augsburg by Charles V., and there the Lutherans presented their confession of faith, which was drawn up by Melancthon and approved by Luther. [Augsburg, Confession of.] In 1534 Luther completed his German version of the Bible.

The remaining years of Luther's life were passed in comparative quiet, chiefly at Wittenberg, in the duties of his professorship, in writing religious and controversial tracts, and in epistolary correspondence. At the beginning of 1546 he quitted Wittenberg for Eisleben, where he died on Feb. 17 of that year.

Luther's works have been repeatedly published. Among his works, those of most interest to the general reader are his 'Table Talk,' *Tischreden*, his familiar letters, and his sermons.

(J. Alb. Fabricius, *Centifolium Lutheranum*, 2 vols., 1728–30, gives a list of all the authors who had then written concerning Luther and his Reformation.)

LUTI, BENEDETTO, Cavaliere, was born at Florence in 1666. He was the scholar of A. D. Gabbiani, and he went about 1690 to Rome, where he died in 1724. Luti has been called by some the last of the Florentine masters. Luti painted in fresco, in oil, and in pastel. His masterpiece is the large picture of the Vest of San Ranieri, in the cathedral of Pisa.

LUTON. [Bedfordshire.]

LUTRA. [Otter.]

LUTTERWORTH. [Leicestershire.]

LÜTZELBURGHER, or LEUTZELBURGER, HANS, called also Hans Frank, an early Swiss wood-engraver of Basel. He lived in the early part of the 16th century. There are many other celebrated old cuts, some from drawings by Holbein, attributed to Lützelburger.

LUXEMBOURG, formerly a grand-duchy in the kingdom of the Netherlands, but now divided between Holland and Belgium, is bounded E. by Prussia, N. by Liège, W. by Namur, and S. by France. *Dutch Luxembourg*, the possession of which gives the King of Holland the title of Grand Duke, and a voice in the German Confederation, lies E. of Belgian Luxembourg, and has an area of 986 square miles, with a population in 1848 of 186,062. *Belgian Luxembourg* is the largest and more western part of the former Grand-Duchy; it has an area of 1694 square miles, with a population (in 1846) of 186,394. The principal rivers of Luxembourg are the Moselle, the Sure, and the Our, which form the boundary between Dutch Luxembourg and Prussia; the Elze or Alzette, a feeder of the Sure; the Semois, which rises near Arlon, and flows W. into the Maas; the Ourthe, which rises near Bastogne, and falls into the Maas near Liège; the Lesse, which rises near Neufchâteau, and falls into the Maas near Dinant.

Luxembourg is crossed from S.W. to N.E. by a range of high ground, part of the Ardennes, which separates the valley of the Maas from that of the Moselle. The soil of this elevated region is calcareous, and is principally occupied as pasturage. The lower lands are very productive, and yield abundant harvests of wheat, rye, flax, hemp, mangel-wurzel, &c. Such of the high lands as are tilled rarely yield anything but rye, oats, and potatoes. Luxembourg contains many large forests. Agriculture is in rather a backward state all through Luxembourg. The vine is cultivated on the banks of the Moselle and the Sûre. The quality of the wine is inferior. In Dutch Luxembourg there is a great number of distilleries, and some iron-works. Horses, horned cattle, swine, and sheep are numerous. In Belgian Luxembourg there are iron-works, slate-quarries, potteries, tanneries, cloth, and paper-mills. Iron and lead mines are worked; copper is found in Dutch Luxembourg.

The city of *Luxembourg*, the capital of Dutch Luxembourg, is a fortress of great strength, in 49° 37′ N. lat., 6° 9′ E. long., on the Elze, 76 miles S.S.E. from Liège, and has about 12,000 inhabitants. The city is surrounded by strong walls and deep ditches, and has a double line of outworks in the form of a heptagon. The town is small but well built; it has four churches, a military hospital, and a newly built market-place. *Echternach*, a walled town on the right bank of the Sûre, 17 miles N.E. from Luxembourg, has a

population of 3417, who are occupied with the manufacture of pottery and woollen cloths.

Of Belgian Luxembourg the chief town is ARLON. The only other towns worth notice are *Bastogne*, population 2500; and *Bouillon*, the capital of the ancient Duchy of Bouillon, which stands near the French frontier, on the left bank of the Semoy, and has 2600 inhabitants.

LUXOR. [THEBES.]

LUXUEIL. [SAÔNE, HAUTE.]

LUZE'RN (*Lucerne*), a canton of Switzerland, bounded N. by Aargau, E. by Schwytz and Zug, S. by Unterwalden, and W. by Bern. Its greatest length, from N. to S., is 33 miles, and its greatest breadth 27. Its area is 586 square miles; and the population is 124,521, who are all Swiss but 626, and all Catholics but 583. The declivity of the valleys is towards the north-east and north-west. The southern part of the canton belongs to the basin of the Reuss, which issues out of the Waldstädter Lake at the town of Luzern, and flows N.E. into Aargau. Below Luzern the Reuss is joined by the Wald-Emme, which rises at the S.W. extremity of the canton. A succession of high grounds, running across the middle of the canton, divides the basin of the Reuss from that of the Aar, to which latter river the northern part of Luzern belongs. North-east of the Sempach Lake, which is in the centre of the canton, is another lake, called the Baldeg Lake. The only mountains in the canton are at its southern extremity, on the borders of the Unterwalden and the Bernese Oberland. None of them attain the limits of perpetual snow. The highest is mount Pilatus, south-west of the town of Luzern, and a conspicuous feature in its landscape. It is a mountain-group nearly 30 miles in length, extending along the borders of Luzern and Unterwalden, and having seven peaks, of which the Tomlishorn (6858 feet) and the Esel (6678 feet) are the highest. The view from these summits is very extensive. The soil of Luzern is fertile; it is one of the very few cantons of Switzerland which produces more corn than it consumes. Fruit-trees are also abundant; the vine is cultivated in some favourable situations. The rearing of cattle is the principal branch of industry in a great part of the canton. In some districts there are manufactories of linen and cotton goods. The trade between Switzerland and Italy by the St. Gothard employs a number of people, and all the goods pass through Luzern and the Waldstädter Lake.

German is the language spoken. Luzern is in the diocese of the Bishop of Basel, who resides at Soleure.

LUZE'RN, the capital of the canton, is situated at the western extremity of the Waldstädter Lake, and is divided into two unequal parts by the Reuss, which issues out of the lake. The larger part, which is on the right bank, is built on the slope of a hill; the whole is surrounded by old walls flanked by towers. The interior of the town presents streets narrow, uneven, and ill paved. The remarkable buildings are—the town-house, the college of the Jesuits, the arsenal, and the three covered wooden bridges, which are the chief curiosities of Luzern. The parochial church and cemetery are outside of the town, and are well worth visiting. Luzern contains 8330 inhabitants. It has two hospitals, a savings' bank, a friendly society, and other benevolent institutions. It has also a collection of minerals, and very good elementary and secondary schools. The forces of the Sonderbund were defeated near Luzern by the Federal army of the Swiss Diet, under Gen. Dufour, on the 24th Nov., 1847. [SWITZERLAND.]

LUZON. [PHILIPPINES.]

LU'ZULA, a genus of plants belonging to the natural order *Juncaceæ*. *L. sylvatica*, the great Woodrush, is found in shady places in Great Britain. *L. campestris* is common in the pastures of this country, and seven species are natives of the British Islands.

LYCAO'NIA, a district of Asia Minor, is first mentioned by Xenophon, who describes it as extending eastward from Iconium in Phrygia to the borders of Cappadocia, a distance of about 110 English miles. ('Anab.,' i. 2, s. 19.) But in the time of Strabo the name of Lycaonia was applied to the south-eastern part of Phrygia.

Lycaonia is described by Strabo as high table land, deficient in water. Iconium, the principal town of Lycaonia, and at present Konieh (Strabo, xii. 6; Cic., 'Fam.,' xv. 4; Plin., 'Nat. Hist.,' v. 25), was situated in a fertile plain at the foot of Mount Taurus. Isauria is mentioned by Strabo as part of Lycaonia; it contained the cities of Larauda, Lystra, and Derbe; the two last of which were visited by St. Paul. (Acts, xiv. 6.)

LYCHNIS, a genus of plants belonging to the natural order *Caryophylleæ*, and to the sub-order *Sileneæ*. *L. Chalcedonica*, the Scarlet Lychnis, produces scarlet, rose-coloured, or white flowers, and is a great favourite in our gardens; it is a native of Siberia and Japan. Several varieties of this plant have been named. *L. grandiflora* has large beautiful scarlet flowers, and is a native of China and Japan. *L. Flos Cuculi*, Ragged Robin, has rose-coloured petals, and is an abundant plant in the moist meadows and pastures of Great Britain, as well as the whole of Europe. *L. vespertina*, White Campion, is a common plant in the hedge-banks of Europe. This and *L. diurna*, Red Campion, are frequently regarded as varieties, and then named *L. dioica*.

LY'CIA, a province of Asia Minor, was bounded on the N. by Phrygia, on the E. by Pamphylia, on the W. by Caria, and on the S. by the Mediterranean Sea. The interior of this country was entirely unknown till the recent discoveries of Mr. Fellows, which have corrected the erroneous representations of the maps. The coast is bordered by lofty mountains, but there are no high mountains in the interior. The Xanthus, which has been represented as a small stream, is a river of considerable length, flowing from the mountains in the north of Lycia; and the whole of the interior is a fertile plain, surrounded by mountains, and drained by the Xanthus.

That Lycia was early colonised by the Greek nation is evident, not only from the account of Herodotus, but also from many other Lycian tra-

ditions, as well as from the worship of Apollo, which was spread over the country. Xanthus was a Cretan settlement. The chief temple of Apollo was at Pátara.

In the time of Strabo the Lycians had a kind of federation consisting of 23 cities, which sent deputies to an assembly, in which a governor was chosen for the whole of Lycia, as well as judges and inferior magistrates. All matters relating to the government of the country were discussed in this assembly. The six principal cities, Xanthus, Pátara, Pínara, Olympus, Myra, and Tlos, had three votes each; other cities two votes each; and the remainder only one each. In consequence of dissensions between the different cities, this constitution was abolished by the Emperor Claudius; and the country was united to the province of Pamphylia.

The country is now well inhabited, chiefly by Turks, many of whom lead a life half settled and half nomadic; they are distinguished by their excellent character. Most of them are farmers or herdsmen; trade is chiefly carried on by Armenians and Greeks, who live in the sea towns, and form the greater portion of the population of the inland town of Almali, which is the largest in Lycia, the population being about 25,000. The Turkish population is exceedingly careless about money, and when they have enough to eat and to drink—and they are moderate in their habits—they are satisfied, and care for nothing more. The breeding of horses is carried on to a great extent, and herds of many hundreds are often seen grazing together in the valleys. The only kind is that of which such spirited representations are seen in the ancient marbles; the head is of Arabic cast, the chest is very large, the feet are remarkably fine and thin, and the ears are small, as in the antique. They are not shod. No part of Asia Minor contains such splendid valleys as those of the Xanthus and the Dolomon Chái. Myrtle, oleander, and pomegranates cover the banks of the rivers; the plains along the rivers are well cultivated, and in many places the fields are inclosed by fences of myrtle and the small prickly oak, mixed with the orange, the wild olive, the pomegranate, the oleander, the elegant green storax, which are most beautifully matted together by vine, clematis, and many other climbers. The hills are covered with large oaks and planes, which supply excellent timber. The high plain round Almali, which is 4000 feet above the sea, is one of the largest and best cultivated corn tracts in Asia Minor; its chief produce is barley, which is the common food for horses. Maize is chiefly raised in the valleys and on the coast.

(Fellows, *An Account of Discoveries in Lycia; a Journal written during an Excursion in Asia Minor.*)

LY'CIUM. Many ancient authors, and among others Dioscorides, describe under the above name a substance as used in medicine, which is stated to be of two kinds; one obtained from Lycia and Cappadocia, and the other from India. The former is said to be the produce of a thorny shrub called *Pyxacantha*. The latter is stated to be more valuable and efficacious as a medicine, and to be produced also by a thorny shrub, which is called *Lonchitis*. This however appears not to be the case, and Dr. Royle has stated his reasons for believing that this substance is the produce of various species of the genus *Berberis*. See Royle on the 'Lycium of Dioscorides.' 'Linn. Trans.,' 1843.

LY'CODON, a genus of innocuous snakes, of which we may give the *Lycodon Capensis*, Smith (*Lycodon Horstokii*, Schlegel), as an example. See 'South African Quarterly Journal,' 1831, and 'Illustrations of the Zoology of South Africa,' by Dr. Smith, published under the authority of the Lords Commissioners of Her Majesty's Treasury.

LYCOPERDON, a genus of fungi, emitting when burst, either by violence or natural dehiscence, a quantity of dust-like seeds or spores, whence the species are commonly called Puff-Balls. When the common Puff-Ball, *Lycoperdon gemmatum*, first appears, it forms a whitish ball, looking like a common eatable mushroom, but by degrees it changes colour, becomes brown, and, tearing irregularly at the apex, discharges a cloud of brownish dust, consisting entirely of its spores. The Geasters, or Starry Puff Balls, are much less common; instead of bursting irregularly at the apex when ripe, their outer rind separates into a definite number of lobes, which spread open, curve backwards, and at last elevate upon their centre a bag containing the spores. No use has ever been made of any of the Lycoperdons, except in the case of *L. giganteum*, a very large indehiscent species, often many feet in circumference, and filled with a loathsome pulpy mass, which has been employed as a styptic, and for tinder.

LY'COPHRON, a native of Chalcis in Eubœa, was a poet and grammarian at the court of Ptolemæus Philadelphus, from B.C. 280 to B.C. 250, where he formed one of the seven poets known by the name of Pleias. He is said by Ovid to have been killed by an arrow. ('Ibis,' 531.)

Lycophron wrote a great number of tragedies, only one of which has come down to us, entitled 'Cassandra, or Alexandra.' This poem however cannot have any claims to be called a drama; Cassandra is the only person introduced as speaking. The work is written in iambic verse, and has no pretensions to any poetical merit; the style is very obscure, and the meaning of most passages is very doubtful. The best editions of the Cassandra are by Potter, Oxf. 1697, 1702; by Reichard, Leip. 1788; by Sebastian, Rome, 1804; and by Bachmann, Leip. 1833. The commentary of Tzetzes has been published in a separate form under the superintendence of C. G. Müller, Leip. 1812. The 'Cassandra' has been translated into English by Lord Royston.

LYCOPODIA'CEÆ, a natural order of vascular Acrogens, chiefly consisting of moss-like plants, inhabiting moors, boggy heaths, and woods in many parts of the world. They never exceed the height or length of two or three feet, and usually grow prostrate. Some of them, especially *Lycopodium rubrum*, are violent purgatives, and it has been proposed to use others as dyes; but in general they are of little importance to any except the botanical systematist. Their name has how

ever of late been brought frequently before the public in popular works, in consequence of an opinion that certain large fossils common in the coal-measures, and called *Lepidodendra*, are the relics of an extinct gigantic race of these now pigmy species. [COAL PLANTS.]

LYCOPODITES. The affinity of many fossil plants to some of the various genera composing the Lycopodiaceæ is very distinctly pointed out by M. Brongniart, both in the 'Prodrome' (1828) and in the 'Histoire des Végétaux Fossiles.'

LY'COPUS EUROPÆUS, a wild plant inhabiting wet ditches and sides of ponds, belonging to the natural order *Labiatæ*, and known popularly under the name of Gipsy-wort, because gipsies are said to stain their skins with its juice.

LYCURGUS. [SPARTA.]

LYCURGUS, the Athenian orator, the son of Lycophron, was one of the warmest supporters of the democratical party in the contest with Philip of Macedon. The time of his birth is uncertain, but he was older than Demosthenes.

Lycurgus is said to have received instruction from Plato and Isocrates. He took an active part in the management of public affairs, and was one of the Athenian ambassadors who succeeded (B.C. 343) in counteracting the designs of Philip against Ambracia and Peloponnesus. He filled the office of treasurer of the public revenue for three periods of five years, and was noted for the integrity and ability with which he discharged the duties of his office.

After the battle of Chæronea (B.C. 388) Lycurgus conducted the accusation against the Athenian general Lysicles. He was one of the orators demanded by Alexander after the destruction of Thebes, B.C. 335. He died about the year B.C. 323, and was buried in the Academia.

Only one of the orations of Lycurgus has been preserved. This oration, which was delivered B.C. 330, is an accusation of Leocrates, an Athenian citizen, for abandoning Athens after the battle of Chæronea, and settling in another Grecian state.

The best editions of Lycurgus are by Taylor, who published it with the 'Oration of Demosthenes against Midias,' Camb., 1743; Bekker, 1821; Pinzger, 1824; Blume, 1827; and Baiter and Saupp, 1834. It is also included in the editions of the 'Oratores Græci' by Reiske and by Bekker, and has been translated into French by Auger, Paris, 1783.

LYDGATE, JOHN, was a monk of the Benedictine Abbey of Bury St. Edmund in Suffolk. It has been conjectured that he was born about 1375. Warton says he seems to have arrived at his greatest eminence about the year 1430. He was eminently skilled in French and Italian, and wrote in English with great perspicuity. Ritson, in his 'Bibliographia Poetica,' has given a list of no fewer than two hundred and fifty-one pieces by Lydgate. His MS. of the 'Life of St. Edmund,' which he presented to Henry VI., is in the British Museum. It is conjectured that he died about 1461.

LYDD. [KENT.]

LY'DIA, a country of Asia Minor, the boundaries of which varied at different times. Under the Roman empire it was bounded on the S. by Caria, from which it was separated by the river Mæander; on the N. by a range of mountains named Sardene, which divided it from Mysia; on the E. by Phrygia; and on the W. by the Ægean, though the tract of country along the coast was more commonly called Ionia. Lydia was intersected by mountain-ranges, running from east to west, of which the principal, called Méssogis by Strabo, forms the northern boundary of the valley of the Mæander. Another chain of mountains, named Tmolus, runs parallel to the Méssogis, and terminates on the west coast opposite the island of Chios. A branch of Tmolus, called Sipylus, stretches more to the north-west, towards the towns of Cuma and Phocæa. Lydia is thus divided into two principal valleys; the southern, between Méssogis and Tmolus, through which the Caystrus flows, is of moderate extent; but the northern, between Tmolus and Sardene, watered by the Hermus, and its tributaries the Hyllus, Pactólus, and Coganus, forms a considerable plain. The fertility of Lydia and the salubrity of the climate are frequently mentioned by ancient writers. Chishull speaks of the country between Tmolus and Méssogis as a 'region inexpressibly delicious.'

According to Herodotus, the Lydians were of a common origin with the Carians and Mysians (i. 171).

The early history of Lydia is told by Herodotus (i. 6, &c.), who says that three dynasties ruled in Lydia: the Atyadæ, the Heraclidæ, and the Mermnadæ, from B.C. 716 to 556. The proper history of Lydia begins with the last of these dynasties. The first king of this dynasty was Gyges, and the last was Crœsus. The Lydian kingdom had its greatest extent during the reign of Crœsus, who subdued all the people of Asia Minor west of the river Halys (Kizil-Ermak), with the exception of the Cilicians and Lycians. (Herodot., i. 28.) But this empire was overthrown by Cyrus (B.C. 556); and the country became a Persian province. After Alexander's conquests, Lydia, with the rest of Western Asia, formed part of the empire of the Seleucidæ; and, on the conquest of Antiochus by the Romans, B.C. 189, it was given to Eumenes, king of Pergamus. On the death of Attalus III., B.C. 133, it came, with the other dominions of the kings of Pergamus, into the power of the Romans.

The Lydians carried on a large trade, and had abundance of the precious metals. The Lydians are said by the Greeks to have been the first people who put a stamp upon gold and silver.

The most extraordinary work of art in ancient Lydia was the enormous sepulchral mound of Alyattes, the father of Crœsus. [ALYATTES*.]

The Grecian towns on the coast of Lydia belong to IONIA. The most important of those towns which properly belonged to Lydia were Sardis, Philadelphia, and Thyateira.

Sardis, called at present Sart, is situated on the Pactólus, a tributary of the Hermus, in an ex-

* Herodotus describes the mound as 1300 feet in width. It is erroneously stated at 2600 feet in the art. ALYATTES.

tensive plain. The citadel was situated on a lofty hill, which was a perpendicular precipice on the back part, which looked towards Tmolus. Sardis was the capital of the Lydian kingdom, and the residence of the Persian satraps of the country. It was nearly destroyed by an earthquake in the time of Tiberius (Tacitus, 'Ann.,' ii. 47); but it was rebuilt. Sart is at present a miserable village; but there are large ruins of the ancient Sardis.

Philadelphía, called at present Allah Shehr (that is, City of God), 28 miles south-east of Sardis, stands on a part of Mount Tmolus, by the river Coganus. To the east of Philadelphia Strabo places the district of Katakekaúmene, or 'Entirely-burnt,' 500 stadia in length and 400 stadia in breadth. He describes the surface of the plain as covered with ashes, and the mountain rocks as of a black colour, as if they had been subject to the action of fire. ('London Geog. Journal,' vol. viii. p. 142.)

Thyateira, called at present Akhissar, was built by Seleucus Nicátor. It was famous for the art of dyeing purple. (Acts, xvi. 14.) Thyateira, Philadelphia, and Sardis are three of the Seven Churches which are addressed in the Book of Revelations.

LYDUS, JOANNES LAURENTIUS, was born at Philadelphia in Lydia (whence he derived his surname), about A.D. 490. He died about the latter end of Justinian's reign. Lydus appears to have been well acquainted with Greek and Roman antiquities; and his works contain much curious information on the mythology and history of several of the nations of antiquity.

Three works of Lydus have come down to us: one 'On the Magistrates of the Roman Republic,' edited by Hase, Paris, 1812; a second, 'On the Months,' which has been edited by Roether, Leipzig, 1827; and a third, 'On Omens and Prodigies,' which has also been published by Hase. The best edition of Lydus is by Bekker, Bonn, 1837, which forms a part of the 'Corpus Scriptorum Historiæ Byzantinæ.'

LYE, EDWARD, born 1704, died 1767, distinguished by the attention which he paid to the Saxon and Gothic languages and literature. There is a full account of him in Nichols's 'Literary Anecdotes of the Eighteenth Century,' vol. ix. p. 751-753.

LYGODYSODEA'CEÆ, a natural order of plants closely allied to *Cinchonaceæ*. The only genus of this order is *Lygodysodea*, of which two species, *L. fœtida* and *L. ciliata*, have been described. They are both natives of Peru and Mexico.

LYLY, WILLIAM. [LILY.]

LYME REGIS. [DORSETSHIRE.]

LYMFIORD. [JUTLAND.]

LYMINGTON. [HAMPSHIRE.]

LYMPH, LYMPHATICS. The Lymphatics are the system of vessels which, from the part that they take in the process of absorption, are not unfrequently called absorbents. They consist of minute branched tubes of extremely delicate membranes, whose extremities are arranged in a more or less dense net-work in every part of the body. From this net-work they gradually converge into a succession of branches of increasing size, and terminate in two main trunks, called the right and left great lymphatic veins, through which the lymph is poured with the chyle from the thoracic duct [LACTEALS] into the right and left subclavian veins. The lymphatics also communicate with the veins at some other parts of their course, chiefly near their minute extremities, and more rarely by larger branches. They have in their interior numerous delicate valves formed of crescentic folds of the lining membrane, exactly like those of the veins, and, like them, preventing the retrograde force of the contained fluid.

The Lymph is a thin opaline whitish fluid of a somewhat saline taste, which a short time after it is removed from the body separates into a clear fluid and a soft white or pinkish coagulum.

The name of Lymph is rather vaguely applied to many different morbid secretions which have a thin watery appearance. Coagulating or coagulable Lymph is the fibrinous matter effused in the adhesive inflammation.

LYNCHBURG. [VIRGINIA.]

LYNN. [NORFOLK.]

LYNX. The name of *Lynxes* is applied by Zoologists to a subdivision of the feline group, regarded by Mr. Gray in the light of a genus, to which he has applied the term *Lyncus*. [FELIDÆ.]

Cuvier observes that there are known in commerce, under the name of *Loups Cerviers* (*Lupus cervarius*), four or five sorts of Lynxes, which had long been confounded by naturalists, and whose specific limits were not perhaps well fixed when he wrote. We shall proceed to notice the arrangement of M. Temminck, and then return to observe what part of it is adopted by Cuvier.

M. Temminck gives the following as species:—

1. *Felis cervaria*, described as nearly equalling a wolf in size, and possibly the *Kattlo* of Linnæus and the Swedes; but it has been remarked that no skins of it are contained in the cargoes that arrive from the Baltic. In commerce the skins of *F. cervaria* are said to be only obtained from the markets of Moscow, to which they are brought from the provinces of Asia. It is considered as probable that this species may have been confounded, under the name of the *Canadian Lynx*, with

2. *F. Borealis*, which is intermediate in size between the fox and the wolf. This comprehends the *Canadian* but not the *Mississippi Lynx* of Cuvier, and is said to inhabit the north of both the old and the new continents: its fur, less valuable than that of *F. cervaria*, is stated to be received equally from Sweden and from Hudson's Bay.

3. *F. Lynx* (true Lynx), different from, but nearly allied to, *F. cervaria*, *F. Borealis*, *F. rufa*, and

4. *F. pardina*. Size of a badger, but the legs longer, resembling *F. rufa* in form and size; tail short, but longer in proportion than that of *F. Lynx*. *F. pardina* is the *Loup Cervier* of Perrault, and is found only in the south of Europe, the centre being the locality of the true Lynx*.

* With respect to *Felis pardina*, Col. Sykes makes the following statement: 'Although Temminck, in his

5. *F. Caracal, Nubian Caracal,* and *Cat of the Desert* of Bruce, *Persian Cat* (*Lynx*) of Pennant.

6. *F. aurata.* Rather less than the Caracal. Country unknown. Skin purchased from a London dealer.

7. *F. Chaus* (Güldenstedt), figured by Schreber. The other animals described under this name are considered to be referrible to

8. *F. Caligata; Booted Lynx* of Bruce; *F. Libycus* (Olivier); *Libyan Caracal* of Buffon.

Of these, Baron Cuvier notices *Felis cervaria* as the finest and largest; *Felis Borealis; Felis Lynx,* which has almost entirely disappeared from populous countries, but is still to be found in the Pyrenees, the mountains of the kingdom of Naples, and even, it is said, in Africa; *Felis pardina,* Oken, from the south of Europe; *Felis rufa,* Gülden.; and *Felis Chaus,* or *Lynx of the Marshes* of Caucasus, Persia and Egypt. Cuvier further observes, that it is believed at present that the *Booted Lynx, Felix caligata,* Temm., may be distinguished from *Felis Chaus;* but he remarks that *F. caligata* is at least very nearly approximated to it, and that it has the same habits.

Felis Caracal (Persia, Turkey, &c.), which he considers to be the true Lynx of the ancients, closes Cuvier's list of species; but he alludes in a

Caracal (*Felis caracal*).

note to *Lynx faciatus, L. floridanus,* and *L. montanus* of Rafinesque; and to *Felis aurata* of Temminck, as belonging to this tribe.

M. Lesson gives the following species:—1. *F. Lynx,* the *Loup Cervier* of the Furriers. He states that the whole of Europe is its habitat, where it has become very rare. 2. *F. pardina,* Temm., *Loup Cervier* of the French Academicians; to this Portugal, Sardinia, Sicily, and Turkey are assigned as localities. Next follows *Felis Serval,* which cannot be considered a Lynx. 3. *F. cervaria,* Temm. 4. *Felis Borealis,* to which the northern countries of America and Asia are given as its distribution. 5. *Felis Caracal,* the *Lynx* of the ancients (Africa, Persia, and Arabia). 6. *F. Chrysothrix* and *F. aurata,* Temm.; country unknown. 7. *F. Chaus,* Gülden. (Egypt, Nubia, and Caucasus). 8. *Booted Lynx* (*F. caligata,* Bruce, Temm.). To this a range is given from Egypt to the Cape of Good Hope in Africa, and the south of Asia. M. Lesson also notices as specifically different the *Felis Manul* of Pallas and Desmarest, a species not admitted by Temminck, but which has, according to Pallas, the appearance of the *Lynx.* (Mongolian Tartary.)

Sir William Jardine ('Naturalist's Library,' Mammalia, vol. ii. 1834), who adopts the genus *Lyncus* or *Lynchus* of Mr. Gray, as the fifth genus of the *Felinæ,* enumerates the following species: *Lynchus Caracal; L. aurata; L. Chelidogaster,* inhabits Chili (Temm., Mus. Leyd.); *L. caligata,* Bruce; *L. nigripes,* Burchell, inhabits South Africa; *L. Chaus* (Gülden., Rüpp.); *L. Canadensis; L. rufa,* Bay Lynx, inhabits banks of Columbia River, United States, not Canada (Temm.); *L. fasciata,* Banded Lynx (Richardson), inhabits N. America, woody countries in the neighbourhood of the Pacific (Lewis and Clark); and *L. Lynx.*

Sir William Jardine remarks, that there is yet considerable confusion among the Lynxes of America, and that, except the Canada Lynx, the species are perhaps not well determined. He observes that M. Vigors and Dr. Horsfield describe one under the title of *F. maculata* from Mexico.

Sir William further states that another Asiatic Lynx may be perhaps added in the *Felis affinis* of Mr. Gray, figured in his 'Illustr. of Indian Zoology.'

It may be necessary also to call the reader's attention to two species of *Felis,* one in the volume of the 'Naturalist's Library,' *F. Servalina,* figured as *F. ornata,* which Sir W. Jardine at first considered as identical with Mr. Gray's species with the last-mentioned name, but which Mr. Gray considered to be distinct. The figures of both *F. ornata,* Gray ('Illustr. Ind. Zool.'), and *F. Servalina,* Jardine, have small tufts on the tips of their ears, and are otherwise inclined to be lynx-like, as if they formed the passage between some of the smaller Spotted Cats and the Lynxes.

LYNX, a constellation of Hevelius, situated directly in front of Ursa Major, the head of the animal being half way between *a* Ursæ Majoris and Capella.

LYON (the ancient *Lugdunum*), the capital of the department of Rhône, in France, is situated at the confluence of the Rhône and the Saône, in 45° 45′ 45″ N. lat., 4° 49′ 10″ E. long., 288 miles S.E. of Paris, and has 159,753 inhabitants. The population is probably over 200,000, including the suburbs of Croix-Rousse and Guillotière, which at the time of the last census formed communes distinct from the city. Lugdunum is said to have been founded by L. Munatius Plancus,

'Monographie de Mammalogie,' p. 116, in a note, says the skin of this European Felis is well known amongst the furriers as the Lynx of Portugal, I have nowhere been able to meet with a specimen in London; and, as amongst my friends scarcely any one appeared to be aware of the existence of a Spanish Lynx, I thought it might be acceptable to the members to exhibit specimens in a state of maturity and nonage. In Andalusia, whence the specimens come, it is called *Gato clavo* (*clavo* meaning the pupil of the eye), illustrative of the spotted character of the skin. Some peasants in Andalusia make short jackets of the skins. The animal inhabits the Sierra Morena. I bought both skins at Seville for thirty reales, about 3*s.* 6*d.* ('Zoological Proceedings,' 1838.)

who settled here a portion of the inhabitants of Vienna (Vienne), when driven from their homes by a revolt of the Allobroges, about 42 B.C. Strabo describes it as the most populous city of Gaul, except Narbonne (iv. 192, Casaub.). It was the great mart of the Romans, who had a mint here for coining gold and silver money; and it gave name to one of the four great divisions of Gaul. Lugdunum was utterly destroyed in a single night by fire, about A.D. 59, and was rebuilt chiefly by a grant from the Emperor Nero, to whom the citizens manifested their affection and fidelity in his downfal. In the beginning of the fifth century, the Burgundians possessed themselves of this town and of the south-eastern part of Gaul. On their overthrow, it came into the power of the Franks. Lugdunum, during the Roman period, occupies a considerable place in ecclesiastical as well as in civil history. The Gospel had been early introduced into this part of Gaul, and here a severe persecution raged in the reign of Marcus Aurelius Antoninus (A.D. 172 or 177). The churches at Vienna (Vienne) and Lugdunum sent a relation of their sufferings to those of Asia and Phrygia. Pothinus, bishop of Lyon, was one of the martyrs in this persecution. His successor was Irenæus, one of the most eminent of the early Fathers.

In the division of the Frankish kingdom under the Merovingian princes, Lyon, as we may now call it, was included in the kingdom of Bourgogne (A.D. 561–613). In the division of the Frankish empire among the grandchildren of Charlemagne (A.D. 843), Lyon, with the district of Lyonnais, fell to the lot of the Emperor Lothaire, and in the subsequent division of his states (A.D. 855) it fell to Charles, king of Provence, who made it his usual residence. On his death (A.D. 863) it was seized by Charles le Chauve, king of France. On the re-establishment of the kingdom of Bourgogne by Boson (A.D. 879), Lyon was included in his dominions. In the troubled period of the later Carlovingian kings of France, Lyon was subject alternately to that kingdom and to the kingdom of Bourgogne Transjurane. It was in these troubled times that the counts or governors of Lyon succeeded in establishing an hereditary sway over the districts of Lyonnais, Forez, and Beaujolais, but not over the city of Lyon, the lordship of which was obtained by Bouchard, archbishop of Lyon, and after his time remained annexed to the see. The archbishops, whose temporal power over the city was confirmed by the emperor in 1157, received the title of exarch: they were allowed free and independent jurisdiction, except so far as they were subject to the supreme authority of the emperor and the general laws of the empire.

About the middle of the 13th century, the citizens of Lyon became dissatisfied with the government of their ecclesiastical rulers; they elected a municipal body, between whom and the archbishop dissensions broke out, which led to the annexation of the city to the dominion of the French crown, the judicial administration remaining partly in the hands of the archbishop, partly in the municipality or consulate, as the civic council of Lyon was called. The citizens had the right to elect their own magistrates, and to control the receipts and outlay of the municipal officers; they were also exempt from the jurisdiction of any courts but those established in the city. Under this government the town increased in population, wealth, and commerce, till the 16th century, when it suffered much at the hands of the Huguenots, but recovered its prosperity in the seventeenth and eighteenth centuries. In the year 1793, during the government of the Convention, the people of Lyon rose against the tyranny of the revolutionary club which had been established in the city, and, seizing the town-hall, put Challier, president of the club, to death. To avenge this affront, the Convention sent an army of 60,000 men with a hundred pieces of cannon. The town was bombarded, and obliged, after a siege of 66 days, to yield to famine and force; and, during the cruelties that followed in the next five months, nearly six thousand victims perished, including those who fell in the defence; the principal buildings were demolished; and a new name—*Commune Affranchie*—was given to the city. This dreadful blow, together with the long war which followed the French Revolution, caused the commerce and manufactures of Lyon to languish. On the return of Napoleon from Elba in 1815, his cause was espoused by the Lyonnese. In 1831 and 1834, Lyon was the scene of great disturbances, which originated in the disputes of the trades-unions with the master-manufacturers respecting wages, but had also connection with the republican party who headed the insurrection, and were ready to make it subserve their own purposes. In the last-mentioned year, the insurgents by barricading the suburbs contested the possession of the town for two days with the military, but at the end of that time they laid down their arms.

The city of Lyon is very advantageously situated on the line of railway from Paris to Marseille, now in course of construction, and on two navigable rivers, the Rhône and the Saône, in the fork between which the greater part of the town is built. This part of Lyon consists mostly of narrow crooked dirty streets, formed by solidly built houses of 7 or 8 stories high. To afford room for the extension of the town southwards, the two rivers have been made to meet about a mile below their original junction, thus forming the peninsula of Perrache, on which the streets are built with more regularity and elegance, and some beautiful promenades are laid out. The old fortifications between the city and the hill and suburb of Croix-Rousse prevented the extension of the town northwards, but by a decree of the French Republic, dated March 1848, these fortifications were ordered to be demolished, and a wider enceinte to be constructed, so as to include this suburb, which was thence to be considered as an integral part of Lyon. A considerable part of the town lies on the right bank of the Saône, both shores of which are lined with quays. Here also is the steep hill and suburb of Fourvières on the south-west; and the suburbs of Serin and Vaize on

the west. On the left bank of the Rhône are the suburbs of Brotteaux and Guillotière; its right bank is lined with quays throughout the whole length of the city, some of them being planted with trees and forming delightful promenades.

The suburbs of Fourvières and Croix-Rousse are chiefly inhabited by silk-weavers. The hill of Fourvières is said to derive its name from *Forum-Vetus*, an ancient Roman structure which stood on its summit, and on the site of which the church of Notre Dame is now built. The remains of an aqueduct and amphitheatre have been found on this hill. From the terrace close by this church, or from a tower erected near it, the view over the city of Lyon, its two noble rivers, its squares, chief structures, quays, avenues, and bridges, the hills and plains in the vicinity, of the snowy peak of Mont Blanc and the Alps of Dauphiné in the far distance, presents one of the most varied and most beautiful panoramas in Europe.

The Rhône, which runs along the eastern side of the town, flows with a rapid current 656 feet wide, and is spanned by four bridges, that unite the city to the populous suburbs of Guillotière and Brotteaux, which are protected from the inundations of the river by high embankments. The Saône flows in a gentle current with a breadth of 492 feet along the base of the hill Fourvières, a projecting crag of which formerly blocked up the passage along the right bank, but was cut through by the Romans, and hence it got the name of Petra Exscisa, still remaining in the modern name Pierre-Scise. The Saône is crossed by nine bridges.

Of the 50 squares or open spaces in the city, the finest are—the Place-Bellecour, which is planted with lime-trees and is one of the largest squares in Europe; and the Place-des-Terreaux, of which the town-hall and the Palais-des-Arts form two sides.

The public structures of Lyon are numerous, and, with some exceptions, more remarkable for solidity than elegance. These the space allowed for this article will permit merely to mention. Among the chief religious edifices are—the splendid cathedral of St.-Jean, on the right bank of the Saône, the churches of St.-Pierre, d'Ainai, de l'Observance, Notre-Dame-de-Fourvières before mentioned, St.-Nizier, St.-Bonaventure, St.-Polycarpe, des-Chartreux, St.-Georges, St.-Irénée, and St.-Just. These, together with the palace of the archbishop, form a series of buildings interesting from their architecture, extent, decorations, and antiquity. Among the civic structures are the prefect's residence, once a Jacobin convent; the town-hall, the finest building of the kind in France; the court-house, on the Quai-de-la-Saône; the public library; the Palais-des-Arts, in which are an exchange, galleries of paintings and sculptures, cabinets of medals, collections of minerals, and of natural history, specimens of silk manufactures, &c.; the Loge-du-Change, formerly an exchange, now a Calvinist temple; the college, situated on the Quai-du-Rhône; the mint; the general hospital, or Hotel-Dieu; the Maison-de-la-Charité, or asylum for the poor; the hospital de l'Antiquaille, built on the site of the Roman palace in which Claudius, Caligula, and Germanicus were born; the Mont-de-piété; the prisons; the two theatres; and the numerous barracks.

The fortifications of Lyon are formed by a series of detached forts, seven of which are built on the left bank of the Rhône, and the rest on the heights of Croix-Rousse, and the hills on the right bank of the Saône. The environs of Lyon are dotted with numerous country seats, gardens, and vineyards.

Lyon is an important manufacturing town. The staple articles of industrial produce are silk stuffs of all descriptions, which for solidity of texture, richness and permanence of dye, and beauty of design, are not equalled elsewhere. In this manufacture about 100,000 of the population are directly or indirectly concerned. Cashmere and silk shawls, ribands, cotton cloth, hosiery, hats, printed calico, jewellery, liqueurs, chemical products, gold and silver lace, crapes, tulle, glue, sheet lead, musical strings, ornamental paper, &c., are also made. There are, besides, numerous printing establishments, dye-houses, metal foundries, glass works, potteries, tan-yards, breweries, boat-building yards, &c.

Lyon is also, from its advantageous position, a place of great commerce. The products imported into the town for its own consumption, or for re-exportation, are wine, brandy, oil, hemp, flax, soap, rice, chestnuts, salt, raw cotton, coffee, indigo, sulphur, lead, teazles, madder and other dye-stuffs, &c. Timber, firewood, building-stone, and asphalte are the chief articles brought down the Rhône to this city. Down the Saône are brought timber of all kinds, oak staves, firewood, charcoal, tanning bark, iron and iron ore, gypsum, hay, straw, corn, building-stone, bricks, tiles, &c. Steamers ply on the Saône to Châlon-sur-Saône, and on the Rhône to Avignon and Arles. The town has communication with the Rhine by the Canal du-Rhône-au-Rhin; and with Paris by the Saône and the canals that join it to the Seine. A railroad, 35 miles in length, unites Lyon to the great manufacturing town of St.-Etienne and the extensive coal fields of the department of Loire.

Lyon gives title to an archbishop, whose see includes the departments of Rhône and Loire. It is the seat of a High Court (Cour Royale) and of a University Academy, which have jurisdiction over the departments of Ain, Loire, and Rhône. Connected with the university there are in Lyon faculties of theology and the sciences, a secondary school of medicine, and a college; and within the jurisdiction 6 colleges, 62 boarding-schools, 3 primary normal schools, and 1470 day-schools. The city has also a tribunal of first instance, a tribunal and chamber of commerce, a council of Prud' Hommes, an academy of sciences and arts, a theological college, a school of the fine arts, a mint, an establishment for deaf-mutes, a school of arts and trades, besides various other literary, scientific, and benevolent institutions.

(*Dictionnaire de la France;* Macgregor's *Statistics.*)

LYONNAIS, a former province of France,

which now forms the departments of RHÔNE and LOIRE. Lyon was its capital.

LYRA (the Harp), one of the old constellations, representing the lyre of Mercury (Aratus), of Mercury or of Orpheus (Hyginus). It is surrounded by Cygnus, Aquila, Hercules, and the head of Draco. Its brightest star, α Lyræ, also called Vega, is a conspicuous object. If a line be drawn through the middle of Cassiopeia, the pole-star, and the middle of Ursa Major, this star may be seen nearly in the perpendicular to that line drawn through the pole-star. When Aquila is known, a line drawn through its four neighbouring stars, θ, β, α, and γ, will pass through α Lyræ.

LYRE (Λύρα), a musical instrument of the stringed kind, known, under various names, from the earliest historical period. Some of the Greeks ascribe its invention to Mercury, some to Apollo; but it is possible that they may have had it from the Egyptians, and the Egyptians from Asia. Of many instruments, figured or described in early writings, it is difficult to decide whether they should be termed lyres, lutes, harps, or guitars. The most ancient Grecian lyre had only three strings. That of Terpander had seven. Timotheus increased the number to eleven; and others were gradually added, till they reached sixteen, fifteen of which rendered the principal sounds in the Greek scale, and the sixteenth was the *Proslambanomenos*, the added or supernumerary sound.

LYRIC POETRY is commonly understood to be that kind of poetry which is composed in order to musical recitation; but the epithet has been transferred to all kinds of verse partaking in any degree of the same nature as that to which it was first applied. Thus we hear of lyrical ballads, the greater part of which might with as great propriety be called epical, and of lyric measures in Horace, where there is no ground to suppose that they were sung, and no fitness for the purpose of musical rehearsal. In a former article [EPIC POETRY], a distinction has been made between epic and lyric poetry more satisfactory than common language allows. There is no impropriety in giving a decided meaning to words which have usually been understood in a confused sense, particularly when, as in the present case, the same senses have been applied to each, so as not only to confuse, but to confound them. Lyric poetry may then be defined as that class of poetry which has reference to and is engaged in delineating the composer's own thoughts and feelings, in distinction from epic poetry, which details external circumstances and events.

LYS. [BELGIUM; SCHELDE.]

LYSANDER, a Spartan, who rose to eminence towards the end of the Peloponnesian War, and was placed in command of the Lacedæmonian troops on the coast of Asia Minor, B.C. 407. Unlike most of his countrymen, he had great flexibility of character, and he gained the regard and confidence of his Persian allies. During his year's command he defeated the Athenian fleet, commanded by Antiochus, as lieutenant of Alcibiades, at Notium. In September 406, he was superseded by Callicratidas, who was defeated and slain in the memorable battle of Arginusæ. The allies petitioned that Lysander might be reappointed; and, having resumed the command, he gained the decisive victory of Ægospótami, in the Hellespont, where 170 Athenian ships were taken. This in effect finished the Peloponnesian War. Lysander proceeded to Athens, and blockaded the ports, while the Spartan kings invested the city, which was reduced by the sure process of famine. The capitulation was settled, B.C. 404, and Lysander entered the Peiræus.

He accompanied Agesilaus during his first campaign in Asia, where his popularity and renown threw his superior into the shade; and an estrangement resulted, in which Lysander behaved with temper and wisdom. About B.C. 396 he returned to Sparta. In the following year, on occasion of a quarrel with Thebes, he was sent into Phocis to collect contingents from the northern allies. Having done this, and being on his way to join the Lacedæmonian army, he was taken by surprise, and slain by the Thebans, at Haliartus, in Bœotia.

(Plutarch's *Life of Lysander;* Xenophon's *Hellenica.*)

LY'SIAS, one of the ten Athenian orators, was born at Athens, B.C. 458. His father Céphalus was a native of Syracuse, who settled at Athens during the time of Pericles; he was a person of considerable wealth, and lived on intimate terms with Pericles and Socrates.

Lysias, at the age of fifteen, went to Thurii, in Italy, where he remained for thirty-two years. He returned to Athens, B.C. 411, and carried on, in partnership with his brother Polemarchus, an extensive manufactory of shields. Their wealth excited the cupidity of the Thirty Tyrants; their property was seized, and Polemarchus was taken to prison, where he was shortly after executed (B.C. 404). Lysias escaped to Mégara. (See the oration against Eratosthenes.)

Lysias assisted Thrasybúlus in his enterprise against the Thirty Tyrants. He appears to have died about B.C. 378. Thirty-four extant orations are attributed to Lysias; but some of them may not be genuine.

Dionysius of Halicarnassus allows Lysias almost every excellence except those of sublimity and the power of strongly moving the passions. In narrating events or circumstances, Dionysius considers him superior to all the orators, and as the rule and model in this department of the art. The 'Apology for the death of Eratosthenes' is a pattern of simple and perspicuous narration.

The best edition of the text of Lysias is by Bekker. Useful editions have been published by Taylor, 1738; by Foertsch, 1829; and by Franz, 1831. Lysias has been translated into French by Auger, Paris, 1783, and into English by Gillies, with the orations of Isocrates, London, 1778.

LYSIMACHI'A, a genus of plants belonging to the natural order *Primulaceæ*. *L. thyrsiflora* is found in marshes in the north of England. *L. vulgaris* is the *L. punctata* of some botanists.

LYSI'MACHUS, one of the officers of Alexander the Great, was born of an illustrious Macedonian family. In the distribution of the pro-

vinces to the chief Macedonian officers after the death of Alexander, Lysimachus received Thrace and the neighbouring countries. In B.C. 314 he joined Cassander, Ptolemæus, and Seleucus, in opposing Antigonus. [ANTIGONUS.] The peace, which was made between the contending parties, B.C. 311, lasted only for a short time. The conquests of Demetrius, the son of Antigonus, in Greece, roused the confederates to more vigorous exertions; and Lysimachus was sent into Asia Minor, B.C. 302, where he took several places, and acquired immense plunder. In the following year Lysimachus, having formed a junction with Seleucus, met Antigonus at Ipsus in Phrygia, where Antigonus was killed, and his army defeated.

Lysimachus obtained the north-western part of Asia Minor as his share of the dominions of Antigonus. He shortly afterwards married Arsinoe, the sister of Ptolemæus, king of Egypt, although his eldest son Agathocles had already married Lysandra, the half-sister of Arsinoe. In B.C. 286 he obtained possession of the throne of Macedon. The latter part of the life of Lysimachus was embittered by family dissensions and intestine commotions. Arsinoe, fearful lest her children should be exposed after the death of her husband to the violence of Agathocles, persuaded Lysimachus to put him to death. Lysandra, the widow of Agathocles, fled to Babylon, and entreated Seleucus to make war against Lysimachus. Lysimachus, anticipating his intentions, marched into Asia, and fell in a battle with the forces of Seleucus, in the seventieth year of his age, according to Appian ('Syr.,' c. 64), and in his seventy-fourth, according to Justin (xvii. 1).

LYSIPPUS, one of the most celebrated statuaries of antiquity, was born at Sicyon. He was particularly distinguished by his statues in bronze. He introduced great improvements in his art, by making the head smaller, and giving to the body a more easy and natural position than was usual in the works of his predecessors. His statues were also admired for the beautiful manner in which the hair was executed. (Plin., xxxiv. 8.)

Lysippus is placed by Pliny in the 114th Olympiad (B.C. 324), contemporary with his brother Lysistratus, Sthenis, Euphronides, Sostratus, Ion, and Silanion. Many of his most celebrated works were brought to Rome after the conquest of Greece.

Lysippus is said to have executed 610 statues, all of the greatest merit (Pliny, xxxiv. 7), and many of which were colossal figures.

LYTHRA'CEÆ, a natural order of polypetalous Exogens. They are most near *Melastomaceæ* and *Onagraceæ*. The order contains few plants of any interest.

LYTHRUM, a genus of plants belonging to the natural order *Lythrariaceæ*. *L. Salicaria*, Purple Loosestrife, is a native of Europe, in ditches and watery places, especially about the margins of ponds and rivers, and is found in Britain very plentifully. The colour of the flowers varies from crimson to purple. The herbage is generally almost smooth, and of a dark green, but in dry situations it becomes hoary and downy, or in some degree hairy, as well as more dwarfy in stature. This species is the *Lysimachia* of Pliny, lib. xxv. cap. 7; lib. xxvi. cap. 12, 14. *L. hyssopifolia* is found in damp places in Great Britain. *L. Hunteri*, Hunter's Purple Loosestrife, is a native of the East Indies, where it is used in dyeing.

LYTTELTON, GEORGE LORD, born in January 1708-9, the eldest son of Sir Thomas Lyttelton, Bart. He entered parliament in 1730, and connected himself with the leaders of the opposition to Sir Robert Walpole. After Walpole's retirement Lyttelton was made a lord of the treasury, in 1744. He was raised in 1756 to be chancellor of the exchequer. He went out of office altogether in 1759, when he was raised to the peerage by the title of Baron Lyttelton of Frankley. The rest of his life was chiefly devoted to literature. He died in 1773.

Lord Lyttelton's literary talents are well known. Two of his chief works are a 'History of Henry II.' and 'Observations on the Conversion and Apostleship of St. Paul.'

M is the labial letter of the liquid series.

1. *M* is interchanged with *n*. Thus *m*, at the end of Latin cases and tenses, is generally represented by an *ν* in Greek. Similarly the German dative *ihm* and accusative *ihn* have been confounded in the English *him*, which is at once dative and accusative. The German *boden, busen, besen, faden*, are in English, *bottom, bosom, besom* or *broom, fathom*.

2. *M* with *b*. Thus in Latin *hiemps* coexists with *hibernus, tumeo* with *tuber, glomus* with *globus, fama* with *fabula*. In our own language *husband* is a corruption of *house-man*, the correlative of *housewife*.

3. *M* with *p*. Hence the Greek forms *ομμα, τετυμμαι*, &c., for *οπμα, τετυπμαι*, &c. The Greek *μολυβδος* is in Latin *plumbum*.

4. *M* with *v*. This is particularly the case in the Welsh language. The Latin *amnis* is believed to be identical with the Welsh *Afon*, pronounced *Avon*. The Latin language has *promulgare*, apparently for *provulgare*. Compare also *himmel, heaven ; immer, ever*.

5. *M* with *w* probably. This interchange follows easily from the last, and is a natural step towards the next. The German *mit* seems to be identical with our own *with*, and their longer preposition *wider* is to *mit* or *with* precisely as the Latin *contra* to *con*. The difference of meaning is only apparent, for the notion of hostility is secondary, and belongs to the shorter as well as to the longer forms. Thus in Latin we say *pugnare tecum*, and in English to *withstand*.

6. *M* disappearing. This appears to have been the case even at the beginning of words. Compare the Greek *μεχρις* with *αχρις, μοχλιζω* with *οχλιζω*, the Latin *manus* with the Teutonic *hand*, the Latin *mere-re* with the English *earn*. At the end of words at least, the loss of an *m* is very common, particularly after *o*. Thus the Greek and Latin verb often has the first person ending in *ō*, where analogy would lead to *om ; scribo, τυπτω*. Compare the words *sum, inquam*, besides the other tenses *scribebam, scribam*. In Latin all the adverbs ending in *o*, signifying *motion to*, appear to have lost an *m*, viz. *quo, eo*, &c. Hence *adeo, quoad*, occur in conjunction with a preposition which elsewhere requires an accusative. Again, an *m* has been lost in *posteā, anteā, postillā*, &c. ; compare *postquam, antequam*, &c.

7. *M*, like the other liquids, but not so frequently, is liable to change its position with regard to the vowel of a root. Thus in Greek the root *τεμ, cut*, may take the form *τμη*.

MAAS. [Belgium.]

MAASLANDSLUIS. [Holland.]

MAASTRICHT. [Limburg.]

MABILLO'N, JEAN, born in 1632, became a Benedictine of the congregation of St. Maur in 1654, and died in 1707. His 'Museum Italicum, 1689, and 'Iter Germanicum,' are full of learned matter : his controversial works, such as his 'Traité des Études Monastiques,' 1691, directed against De Rancé and the monks of La Trappe, were highly popular ; and his 'Veterum Scripturarum varia Specimina,' &c., is still much esteemed. He was employed by Louis XIV. to collect books, and is described as one of the most learned and liberal men of his age.

MABLY, ABBE' DE, born at Grenoble in 1709, died in 1785. His political works, which are numerous, are esteemed more for the facts they contain than for their arguments. The principal of them are—'De la Manière d'écrire l'Histoire ;' 'De l'Étude de l'Histoire ;' 'Observations sur l'Histoire de France,' 2 vols. 12mo., 1765, with a posthumous continuation in two more volumes, published in 1790 (this is the best of his historical works).

MABUSE, or MAUBEUGE, JOHN. This eminent painter, whose proper name was John Gossaert, was born at Maubeuge in Hainault, in 1470, according to some authorities ; in 1499, according to others. The finest specimen of this painter, perhaps, is the Wise Men's Offering, now at Castle Howard, the seat of the Earl of Carlisle. He painted chiefly scriptural subjects, but was employed by Henry VII. to paint portraits of his children. The picture is at Hampton Court, and contains Prince Arthur, Prince Henry (Henry VIII.), and Princess Margaret. As Arthur, who was born in 1492, appears about seven years old, Mabuse must have been in England in 1499, one of the dates given for his birth. He died, it is said, in 1562, but it is not known where.

MACA'CUS (French, *Macaque*), a barbarous word adopted as the title of a genus of *Simiadæ* (Monkeys) peculiar to India and the Indian Islands.

In the *Macaci* or Macaques the body is stouter than in the Guenons [Guenons], the head larger in proportion, the limbs more muscular, and the tail shorter. The muzzle is heavy ; the superciliary is boldly prominent, and the forehead is flattened ; the callosities are large, and mostly surrounded by a space of naked skin. There are ample cheek-pouches, and Cuvier states that a laryngal sac is always present. The last molar of the lower jaw has a fifth tubercle, and the molars are broad. The tail is variable ; in some species it is of considerable length, and these, in general form, approximate towards the Guenons (*Cercopitheci*). In others the tail is short and slender ; the ears are angular. The Macaci, like the

Guenons of Africa, which they seem to represent, inhabit the forests, living in troops, and are remarkable for boldness and activity. Emboldened by tolerance, they become very audacious, pillaging the gardens and the fields of grain; and their rapacity is seconded by address and cunning.

Cuvier says, relative to the Magot or Barbary Ape (genus *Inuus*), that it is simply a Macaque with a small tubercle in place of a tail. We regard the Magot as a form intervening between the Macaques and the Cynocephali, but still as a sub-genus of the latter group.

As examples of the genus *Macacus*, we may adduce the Toque or radiated Macaque (*Macacus radiatus*), the *Bonnet Chinois* of Buffon; the Rhesus (*Macacus Rhesus*); and the Wanderoo (*M. Silenus*), a native of Malabar and Ceylon.

Wanderoo (*Macacus Silenus*).

MACAO, a town in China, situated at the southern extremity of the æstuary of the Choo Kiang, or Canton River, 22° 24′ N. lat., 113° 30′ E. long., about 80 miles from Canton by the river. It is built on a low sandy promontory, stretching southward from the island of Macao, which is separated by a narrow channel from the larger island of Kiang-shan-hien. The town extends across the central part of the peninsula from the roadstead of Macao on the east to the interior harbour on the west, and is somewhat more than half a mile wide in this direction, whilst from north-east to south-west it occupies about two miles. The streets are regular, but mostly narrow. The buildings are partly English and Portuguese, but are mostly Chinese. A wall built by the Chinese across the isthmus is carefully guarded by them. The interior harbour is spacious, well sheltered, and has excellent anchoring-ground; but during the south-west monsoon ships use the harbour of Typa Cabrado, which is formed by four small rocky islands, lying south of the southern extremity of the peninsula on which Macao is built.

The Portuguese pay a ground-rent, and Chinese mandarins used to inspect periodically the Portuguese forts, as well as levy a duty on the Macao shipping. In 1849 however the Portuguese declared Macao a free port, and dismissed the mandarins. A mandarin resides within the town, as superintendent for the Emperor of China; he keeps a watchful eye on the inhabitants, and communicates information to his superiors. The population consists of about 30,000 Chinese, 5000 Portuguese, and a few other Europeans. The trade of Macao was formerly considerable, but it has been continually decreasing.

MACARTNEY, GEORGE MACARTNEY, EARL OF, was born near Belfast, May 14, 1737. He was educated at Trinity College, Dublin, and in 1759 entered himself at the Middle Temple, London. In 1764, through the interest of Lord Holland, he was despatched as envoy extraordinary to the Empress of Russia, for the purpose of effecting a commercial treaty with that country, which he brought to a satisfactory conclusion, and returned to England in June 1767.

In 1768 he was returned to parliament, first for Cockermouth, in the English House of Commons, and afterwards for Armagh, in the Irish, and was appointed to the office of chief secretary for Ireland, January 1, 1769. As a debater Macartney distinguished himself in the House against Flood, Dr. Lucas, and other leaders of the opposition. He held his office till June 1772. In 1775 he was created an Irish baron, and made governor of Granada, where in 1779 he was compelled to surrender the island to Count d'Estaing, and was sent prisoner to France, but was very soon exchanged. In 1780 he was appointed governor of Madras, and returned to England in Jan. 1786. In 1792 he was selected to undertake the embassy to Pekin, in which service he gave so much satisfaction that he was elevated to an earldom in the Irish peerage. In 1796 he was created Baron Macartney in the British peerage, and at the end of the year sent as governor of the newly acquired territory of the Cape of Good Hope, where he remained till 1798, when he returned to England, and died March 31, 1806. A selection from his writings was published by Sir John Barrow in 1807, the most important part of which is his 'Journal of the Embassy to China.'

MACASSAR. [CELEBES.]

MACAULAY, CATHARINE, was born in 1733, and died in 1791. Her first husband was Dr. George Macaulay, a London physician, to whom she was married in 1760; her second husband was Mr. Graham, but she is best known as Mrs. Macaulay. She was a most voluminous writer in defence of republican principles, but is chiefly known by her 'History of England from the Accession of James I. to the Elevation of the House of Hanover,' of which the first vol. appeared in 1763, and the fifth in 1771, which however only came down to the Restoration. A sixth volume carried it on to the termination of Walpole's administration in 1742. Though the work went through more than one edition, it has now sunk into oblivion.

MACAW. [PSITTACIDÆ.]

MACCABEES, a Jewish family celebrated for their heroic resistance to the oppression of the Greek kings of Syria in the second century before the Christian æra. Their history is given in the

apocryphal Books of the Maccabees, and in the 'Antiquities of the Jews' by Josephus. [ANTIOCHUS; ASMONÆANS; JEWS; JUDAS MACCABÆUS.]

MACCABEES, THE BOOKS OF THE. Five books have come down to us under this title.

1. *The First Book of the Maccabees* contains the history of the Jews during forty years, from the accession of Antiochus Epiphanes to the death of Simon Matthes, B.C. 135. The author is unknown. Some suppose the book to have been compiled from the Memoirs of the Maccabæan princes, perhaps by John Hyrcanus, about the close of whose reign internal evidence would lead us to fix its date.

2. *The Second Book of the Maccabees* is abridged from an earlier work in five books, by one Jason of Cyrene. (2 Macc. ii. 23–32.) The author is unknown, but from the style he is supposed to have been an Hellenistic Jew.

3. *The Third Book of the Maccabees* is prior in time to the first and second, and in fact has nothing to do with the history of the Maccabees. It contains the history of the Jews at Alexandria during eight or nine years, from the battle of Raphia in B.C. 217. The author is unknown.

4. *The Fourth Book of the Maccabees* contains an account of the martyrdom of Eleazar and the Seven Brethren (2 Macc. vi. vii.), and of the attempt of Heliodorus to plunder the temple. (2 Macc. iii.)

5. *The Fifth Book of the Maccabees* only exists in Arabic and Syriac. It extends from the attempt of Heliodorus to plunder the Temple to within a few years of the birth of Christ.

MACCLESFIELD, a municipal borough and parliamentary borough, in the county of Cheshire, 168 miles N.N.W. from London, and 19 miles S.S.E. from Manchester, is situated on the west side and at the base of a range of high land which is on the borders of Cheshire and Derbyshire, and is a part of the mountain-region of the latter county. The Bollin, an affluent of the Mersey, runs through the town. A canal, which unites the Grand Trunk and Peak Forest canals passes close to Macclesfield, and thus opens a water communication with most parts of England, and a railway extends from Manchester through Stockport to Macclesfield. The town contains four principal streets, diverging from the market-place in various directions; and there are four chief entrances from London, Chester, Manchester, and Buxton. The Town-Hall is a good building, tastefully decorated, and the Public Room is well adapted for concerts and meetings. A subscription library contains about 20,000 volumes. The court-house and gaol are situated in the market-place. The town is lighted with gas, and supplied with water conducted in pipes from the adjoining hills. The various factories are situated on the Bollin. One of the cotton factories cost 30,000*l.*, and some of the silk factories 14,000*l.*; but the value of the latter has been much depressed by the deterioration of the silk-trade. The town contains a dispensary, a savings'-bank, a free grammar-school, and many trusts for charitable purposes.

St. Michael's church was founded by Eleanor, queen of Edward I., in 1378. There are three other churches in the town, besides one in each of the suburbs, Sutton and Hurdsfield. There are also various places of worship belonging to different classes of Dissenters.

Macclesfield is one of the chief seats in the island of the silk-throwing trade, which progressively advanced from 1808 to 1825, when it attained its greatest prosperity. It has since been less prosperous, but is still large. Every variety of silk article is produced here, from the narrowest riband to the different kinds of sarsnets, plain and figured gros de Naples, satin, silk, vestings, and velvets. It is likewise the chief place for the manufacture of silk handkerchiefs of every description.

The municipal borough is divided into 6 wards, and is governed by 12 aldermen and 36 councillors. The population of the town in 1841 was 24,137. The parliamentary borough returns 2 members; population, 32,523.

M'CRIE, THOMAS, was born at Dunse in Berwickshire, Nov. 1772. He entered at the University of Edinburgh in 1788, and was licensed as a clergyman, in 1795, in that branch of the secession from the church of Scotland termed Anti-Burghers. He was immediately afterwards chosen pastor of a congregation in Edinburgh, where he continued to reside during his whole life. In 1812 he published 'The Life of John Knox;' and this was followed by 'The Life of Andrew Melville.' Both of them are works of great research and much merit, though written with strong feelings in favour of the subjects of his biographies. Their author led a blameless, simple life, and died August 5, 1835.

MACCULLOCH, DR. JOHN, was born in Guernsey, October 6, 1773. His indefatigable labours are shown in the long list of his valuable contributions to science. He began life as a medical man, but was called from the practice of his profession to make surveys of Scotland for the government.

His first publication was 'A Description of the Western Islands of Scotland, including the Isle of Man,' &c., in 1819. Among others, followed 'A Geological Classification of Rocks, with Descriptive Synopses, comprising the Elements of Practical Geology,' London, 1821; 'The Highlands and Western Isles of Scotland, in a series of Letters to Sir Walter Scott,' London, 1824; 'A System of Geology, with a Theory of the Earth, and an Explanation of its Connection with the Sacred Records,' London, 1831. In 1827 and 1828, he published 'Malaria, an Essay on the Production and Propagation of this Poison, and on the Nature and Localities of the Places by which it is produced;' and 'An Essay on the Remittent and Intermittent Diseases, including generally Marsh Fever and Neuralgia,' &c. Several other works were produced by him, and many papers contributed to various scientific journals. He died in consequence of a fall from a carriage in 1835.

MACDONALD, ANDREW, an unfortunate man of letters, furnishes the theme for one of the most affecting passages in D'Israeli's 'Calamities of Authors.' He was born about 1755. He

took orders in the Scottish episcopal church. He wrote a tragedy, 'Vimonda,' which was not unsuccessfully represented both in Edinburgh and London. He wrote three other plays, a volume of poems, a novel, and sermons; but he was improvident, and died in London in abject poverty in 1788.

MACDONALD, ETIENNE JACQUES JOSEPH ALEXANDRE, Duke of Tarentum and Marshal of France, was born Sept. 17, 1765, at Sancerre, in the department of Cher, though some authorities make Sedan the place of his birth. He became one of Napoleon's most distinguished generals. His rise in the French army was extremely rapid. He first served on the staff of General Dumouriez during the Revolution. Under Pichegru he distinguished himself by the passage of the Waal, and was made General of Division. Subsequently he was made Governor of Rome; he commanded at Versailles during the 18th Brumaire, and in 1800, as commander-in-chief of the reserve army of Switzerland, made his celebrated passage of the Splugen, which was more difficult than that of Napoleon over the Great St. Bernard.

His brilliant exploits under Napoleon belong to history. Napoleon himself presented him with the marshal's baton on the field of Wagram. In April 1810, he was created Duke of Tarentum. He was with Napoleon in his Russian and German campaigns, adhered to him faithfully in his decline, and endeavoured to procure favourable terms for him from the allies.

On the first restoration of the Bourbons, Macdonald was called to the Chamber of Peers. He steadily refused to join Napoleon on his return from Elba, and on the second restoration of the Bourbons he was named Chancellor of the Legion of Honour, which office he retained till 1831. He died at Paris, September 24, 1840.

MACDONALD, SIR JOHN. [KINNEIR.]

MACDUFF. [BANFFSHIRE.]

MACE. [MYRISTICA.]

MACEDO'NIA. The boundaries of this country varied at different times. In the time of Strabo, Macedonia included a considerable part of Illyricum and Thrace; but Macedonia Proper was separated from Thessaly on the south by the Cambunian Mountains; from Illyricum on the west by the great mountain-chain called Scardus and Bernus, and which under the name of Pindus also separates Thessaly from Epirus; from Mœsia on the north by the mountains called Orbélus and Scomius, which run at right angles to Scardus; and from Thrace on the east by the river Strymon. The Macedonia of Herodotus was still more limited. Macedonia Proper, as defined above, is watered by three large rivers, the Axius (*Vardar*), the Lydias, and the Haliacmon, which flow into the Thermaic Gulf (the modern Gulf of Saloniki). The whole of the district on the sea-coast, and to a considerable distance in the interior, between the Axius and the Haliacmon, is low and marshy. The only other rivers of any importance were the Strymon and the Angítes, whose valleys were separated from that of the Axius by a range of mountains which run from Orbélus on the north towards the peninsula of Chalcídice. The Strymon (*Struma*) rises in Mount Scomius, and flows into the Strymonic Gulf (*Gulf of Orphano*). Not far from the sea it forms a lake, called Cercinítis (*Kerkine*), into which the Angites flows from the eastward.

The Macedonians were probably an Illyrian people, though it appears that the Macedonian princes were an Hellenic race, and parts of the country were inhabited by Hellenic tribes from an early period. Perdiccas is usually regarded as the founder of the Macedonian kingdom, the limits of which were confined to the country in the neighbourhood of Edessa between the Lydias and the Haliacmon. Very little is known of the history of the country till the reign of Amyntas I., who was king of Macedonia at the time of the expulsion of the Pisistrátidæ from Athens, B.C. 560. Amyntas was succeeded by his son Alexander I., who was obliged to accompany the Persian army into Greece, but was able to render important services to the Grecian cause. The time of Alexander's death is uncertain, but he lived at least to B.C. 463. He was succeeded by Perdiccas II., who took an active part in the Peloponnesian War, and alternately assisted Athens and Sparta. His successor Archelaus (B.C. 413) was the wisest king that had yet sat upon the throne of Macedonia. [ARCHELAUS.]

On the assassination of Archelaus, B.C. 399, confusion prevailed for many years; and it was not till the accession of Amyntas II. (B.C. 393), that order was restored. Amyntas was succeeded by his eldest son Alexander II., who was assassinated at the end of the first year of his reign by Ptolemæus Alorites, who was regent for three years during the minority of Perdiccas; but, in consequence of abusing his trust, he was cut off by Perdiccas B.C. 364. Perdiccas, after a reign of five years, fell in battle against the Illyrians, B.C. 359, and was succeeded by his younger brother the celebrated Philip. [PHILIP.] Philip was succeeded by Alexander the Great. [ALEXANDER.] In the disturbances which followed the death of Alexander, the royal family was destroyed, and Cassander obtained at first the power and eventually the title of King of Macedon. Cassander was succeeded by his son Philip, B.C. 296, who reigned two years; and on his death, in B.C. 294, his two younger brothers, Antipater and Alexander, having quarrelled respecting the succession, the throne was seized by Demetrius, the son of Antigonus, who reigned seven years. He was driven from his kingdom, B.C. 287, by Pyrrhus, king of Epirus, who was deposed, after a reign of seven months, by Lysimachus, king of Thrace. [LYSIMACHUS.]

On the death of Lysimachus, B.C. 281, the country remained in a state of anarchy for many years, during the invasion of the Gauls from B.C. 280 to B.C. 278, and the contests between the numerous pretenders to the throne. Eventually Antigonus (surnamed Gonnatas), the son of Demetrius, was proclaimed king, but was dethroned by Pyrrhus, who again obtained the kingdom on his return from Italy. After the death of Pyrrhus, Antigonus regained possession of the throne, which

he retained till his death, B.C. 239. The two following kings, Demetrius II. (B.C. 239–229) and Antigonus II. (B.C. 229–220), were principally occupied in the Grecian wars which followed the formation of the Achæan league. [ANTIGONUS.]

Philip V., who succeeded Amyntas, alarmed at the increasing power of the Romans, entered into an alliance with Hannibal. On the conclusion of the war with Carthage, Philip was unable to cope with the Roman power, and, after continuing the contest for a few years, was obliged to sue for peace. Philip was succeeded by Perseus, B.C. 178, who carried on war against the Romans, and was finally conquered, B.C. 168. Macedonia was divided into four districts, which were considered independent, and governed by their own laws, and of which the capitals were respectively—Amphípolis, Thessalonica, Pella, and Pelagonia. Macedonia was reduced to the form of a Roman province, B.C. 142.

It is very difficult to determine the boundaries of the Roman province of Macedonia. According to the 'Epitomizer' of Strabo (vii.), it was bounded by the Adriatic on the west; on the north by the mountains of Scardus, Orbelus, Rhodope, and Hæmus; on the south by the Via Egnatia; and on the east it extended as far as Cypsela and the mouth of the Hebrus. But this statement with respect to the southern boundary of Macedonia cannot be correct, since we know that the province of Macedonia was bounded on the south by that of Achæa; and although it is extremely difficult, if not impossible, to fix the precise boundaries of these provinces, yet it does not appear that Achæa extended farther north than the south of Thessaly.

MACER, AEMI'LIUS, a Roman jurist, who lived under the Emperor Alexander Severus, or shortly after his time. He was either a contemporary of Ulpianus, or wrote after Ulpianus, for he cites him several times. There are 275 excerpts from Macer in the 'Digest.'

MACERA'TA E CAMERI'NO, a province of the Papal States, is bounded N. by the provinces of Ancona and Urbino-e-Pesaro, E. by the Adriatic, W. by the province of Perugia, and S. by those of Spoleto and Fermo-ed-Ascoli. Its area is 1173 square miles, and its population in 1843 was 264,030. The country slopes towards the north-east from the foot of the central Apennine chain to the coast of the Adriatic. The principal rivers are the Potenza, Chienti, and Musone, which rise in the Apennines and flow into the Adriatic.

The province of Macerata is in part very mountainous and barren, but the valleys and plains towards the sea-coast produce abundance of corn, wine, most kinds of fruit, and very good silk. The coast along the Adriatic has no harbour which deserves the name. Recanati has an anchoring-place for small vessels at the mouth of the river Potenza, where some trade is carried on. The chief towns are the following:—*Macerata*, on a hill in a fine country watered by the Chienti, a well-built town, with 16,000 inhabitants, several churches and convents with good paintings, a college, and a university with a library containing 20,000 volumes, a court of appeal, a handsome town-house, and several fine private palaces, amongst which the Palace Compagnoni is the most remarkable. Macerata is a bishop's see and the residence of the delegate. It carries on a considerable trade in corn, silk, and cattle. *Loreto*, famous for its sanctuary of the Madonna, called the Santa Casa or holy house, which is said to be the house in which the Virgin Mary lived at Nazareth, and to have been miraculously carried, first to a hill near Fiume in Dalmatia, and finally in 1294 to its present site, about 15 miles S.E. of Ancona, near the Adriatic coast. The ground on which the house was deposited belonged to a woman called Lauretta, whence the name of Loreto. The town which has grown up around the sanctuary is well built, and contains 8000 inhabitants. *Recanati*, near the Adriatic, with 4000 inhabitants, and several churches and convents. *Tolentino*, farther inland, near the foot of the Apennines, with 3000 inhabitants. *Camerino*, the ancient Camerinum, an old town among the Apennines, and a bishop's see, with 7000 inhabitants, several churches and convents, and some silk-factories. *Fabriano*, farther north, a bishop's see, with 7000 inhabitants, manufactories of paper and parchment, and a considerable trade in wool. *San Severino*, with 3000 inhabitants. *Matelica*, an old town, with 3000 inhabitants.

MACERATION is the steeping of substances in cold liquids, either merely to soften the parts of the substance operated on, or to dissolve the aromatic parts of a substance when *digestion* would not merely dissolve but dissipate them.

MACHAI'RODUS, a genus of extinct animals established by Professor Kaup upon those canine teeth with serrated or dentilated edges which have been attributed to bears (*Ursus cultridens*, &c.) by Cuvier and others, and to great cats (*Felis*) by Bravard.

Mr. Owen has no doubt that the teeth belonged to a mammiferous animal; and the proof is afforded by the specimen examined, which shows that the tooth was originally lodged in a socket, and not anchylosed to the substance of the jaw, and that the fang is contracted and solidified by the progressive diminution of a temporary formative pulp, and does not terminate in an open conical cavity, like the teeth of all known Saurians, which are lodged in sockets. Careful comparison will show that the canine teeth of Machairodus are very far from those of the bears, and sufficiently removed from those of the tiger, though those of the latter present serrated edges. On looking at the catalogue of the extinct species found at Epplesheim, we do not find any large fossil ruminant noticed, though we find large cats, some as large as a lion, and another carnivorous animal (*Agnotherium*), allied to the dog and also as large as a lion; and we are not without existing ruminants with very long canine teeth in the upper jaw with serrations on their edges, though not so broad in proportion as those of *Machairodus*.

MACHECOUL. [LOIRE-INFE'RIEURE.]

MACHIAVE'LLI, NICCOLO', was born at Florence in 1469, of an old though not wealthy family of that republic. When twenty-nine years

of age, he was made secretary of the 'Ten,' a board which had the management of foreign affairs. Machiavelli's abilities and penetration being soon perceived by his superiors, he was successively employed on many and some very important missions. In the year 1500 Machiavelli was sent as a commissioner to the Florentine camp before Pisa, and subsequently to Paris to conciliate the king towards the Florentines. His mission was eminently successful.

In 1502, Machiavelli was sent on a mission to Duke Valentino, the formidable Borgia, who was then at Imola in Romagna, to make professions of friendship on the part of the Florentines. The account of this mission is extremely curious. Borgia's object was to obtain the command of the Florentine forces; that of Machiavelli to refuse it without offending the tyrant. He has given a full account of this mission in his 'Letters.' In August 1503 Alexander VI. died, and his successor, Pius III., died a few days after. A new conclave being assembled in October, the Florentines sent Machiavelli to Rome, where he was present at the election of Julius II., and soon after witnessed the fall of Cesare Borgia. After visiting France, Rome, and some other places, on various missions, Machiavelli was sent in 1507 to the Emperor Maximilian in Germany. On his return he wrote several reports on the affairs of Germany, besides the letters which he had sent home during his mission: 'Rapporto sulle Cose di Lamagna;' 'Discorso sopra le Cose dell' Alemagna;' 'Ritratti di Lamagna.'

In February 1509 he was sent to the camp before Pisa, which was besieged by the Florentines, and in July 1510 to France a third time. The object of this mission was to encourage the French court to maintain the alliance with the Pope and the emperor against the Venetians (the league of Cambrai), and to induce Louis to prevent the Swiss from enlisting in the service of the Pope. Machiavelli returned to Florence in September 1510, having consolidated the alliance of Florence with France.

When in 1512 the Medici possessed themselves of Florence, Machiavelli, with others of the popular government, was banished, and subsequently imprisoned and put to the torture on suspicion of being implicated in a conspiracy against the Medici. He persisted in declaring himself innocent, and was released by the intervention of Leo X. He then withdrew from public life, and wrote his discourses upon Livy, his books on the art of war, and his 'Principe.' In this work he treats of what he terms mixed principalities, as distinct from republics and hereditary monarchies. The 'Principe' was first published, after Machiavelli's death, at Rome in 1532. The 'Legazioni,' or letters of the political missions of Machiavelli, which are the key to his 'Principe,' were not made public till the middle of the last century.

The chief works of Machiavelli, not mentioned above, are:—'Storie Fiorentine,' which he presented to Clement VII. in 1525, and which come down to the death of Lorenzo the Magnificent, in 1492; and he has left fragments which bring down the history of Florence to 1499; 'La Mandragora,' and 'La Clizia,' two comedies; 'Sette Libri dell' Arte della Guerra;' 'Discorso si la Lingua di Dante, Boccaccio, e Petrarca, debba chiamarsi Italiana, Toscana, o Fiorentina;' besides minor productions and a multitude of letters. The best editions of his works collectively are those of Florence, 1783, 6 vols. 4to.; 1796, 8 vols. 8vo.; and 1818, 10 vols. 8vo.

MACHICOLATION, a term applied to those openings in the parapet of a fortified building through which ignited combustibles, melted lead, stones, &c., were poured and hurled down upon the besiegers. The apertures were formed in the soffit or under surface of the projecting parapet, which was supported upon corbel stones, the perforations themselves being in the soffit, between those stones. By this contrivance the besieged were enabled to harass their assailants, while they themselves were protected by the parapet and its battlements. Machicolations were frequently confined to particular situations, such as over an entrance-gateway and the towers flanking it, or other parts most likely to be assaulted.

MACHIN, JOHN, succeeded Dr. Torriano as professor of astronomy to Gresham College, 16th May, 1713: the date of his birth in unknown. He is the author of a method for determining the quadrature of the circle, by means of the known development of an arc according to the ascending powers of its tangent, which he so modified as to render rapidly convergent. It was however by means of Dr. Halley's method that he computed the ratio of the circumference of the circle to its diameter as far as one hundred places of decimals.

MACHINE, an object by the intervention of which a motive power is made to act upon any body, and overcome the force by which the latter resists the effort to change its state of rest or motion. The advantage which any machine affords for overcoming resistance consists in the reaction by which it supports a certain portion of the weight producing that resistance, so that the motive power has only to counteract the remainder. This may be immediately observed in those simple machines called the mechanical powers. For example, in the lever, the wheel and axle, and the pulley, any convenient portion of the resistance may be made to rest on the point of support, or the point of suspension. Again, in the inclined plane, the wedge, and the screw, the motive power, the resistance, and the reaction of the support, being, in the case of equilibrium, represented by the three sides of a triangle, the ratio of the first to either of the others may be varied at pleasure by the construction of the machine.

The powers employed to give motion, through machinery, to any object, are produced by the muscular strength of men or animals; the actions of weights, springs, wind, water, steam, or fired gunpowder; and these powers may generally be considered as pressures exerted during certain portions of time. Even that power which is produced by a sudden impulse, as when a rammer descending by its weight falls on the head of a pile, is only a pressure existing during an indefinitely short interval of time. The point in any machine

to which the moving power is applied is called the impelled point, and that against which the resistance acts is called the working point.

In estimating the power of a machine, it is usual to make the measure of the power depend on the condition that the impelled and working points shall be in a state of uniform motion. For then, agreeably to the property of the simple lever, the velocities of those extreme points will be inversely proportional to the forces which would be in equilibrio at the same points; and the rule propounded by Euler is, that in every machine, simple or complex, the pressure at the impelled point, multiplied by the velocity of that point, is equal to the product of the resistance at the working point by the velocity of the same point; or the momentum of resistance (commonly called the *performance* of the machine) is equal to the momentum of impulse. Whatever objection may be made to this rule with respect to the measure of the power in action, no doubt can exist that it affords a correct value of the useful effect; and the latter may therefore be measured by the weight which might be raised by the machine to a given height vertically in a given time.

If M represent the mass of any body moved, W its weight, which is equal to Mg, g ($= 32\frac{1}{6}$ feet) expressing the force of gravity; also if H be the height to which the body may be raised in one second of time, and V the velocity which a body would acquire by falling vertically through a height equal to H, we shall have, by the theory of motions, $V^2 = 2g$ H; whence W.H (the momentum of resistance, or the useful effect of a machine) $= \frac{1}{2}MV^2$. This last expression is designated the living or active force of the body moved; and it expresses the force of a body in motion, in contradistinction to the simple pressure exercised by a body at rest.

Descriptions of the several mills, engines, and machines used in manufactures and the arts will be found in Robison's 'Mechanical Philosophy,' and in Gregory's 'Mechanics.'

MACKENZIE, SIR GEORGE, of Rosehaugh, was born at Dundee in 1636. He was by profession a lawyer, and held for many years the important situation of justice-depute. He represented Ross in the Scottish parliament. He is known chiefly by his 'Institutions of the Laws of Scotland,' 1684, a concise and excellent compendium of the law; and his 'Moral Essay upon Solitude.' He wrote however many other works, and was among the first Scotchmen who wrote the English language in a style approaching to purity. He died May 2, 1692.

MACKENZIE, SIR ALEXANDER, emigrated from Scotland to Canada when a young man. He rendered important services to geographical knowledge by his intrepid expeditions from Fort Chipewyan down the Mackenzie River to the Northern Ocean, in lat. 69°, in 1789; and from Montreal through the continent to the Frozen and Pacific Oceans, in 1792. Of this last expedition he has left a full account, published in London, 1801.

MACKENZIE, HENRY, was born at Edinburgh in August 1745. He was the son of Dr. Joshua Mackenzie, a physician. He was educated at the high school and university of his native city; and afterwards he became one of the attorneys in the Scottish Court of Exchequer. While in London, in 1765, studying the English practice in Exchequer, he had begun to write his earliest and best novel, 'The Man of Feeling,' which was published anonymously in 1771. In 1783 he published his second novel, 'The Man of the World;' and next came 'Julia de Roubigné,' his last considerable work of this class. Meantime he had edited two well-known periodicals; 'The Mirror,' which continued to appear weekly for seventeen months from January 1779; and 'The Lounger,' which, begun in February 1785, came to a close about two years afterwards. Besides minor productions he wrote several plays, of which the principal are, 'The White Hypocrite,' 'The Spanish Father,' and 'The Prince of Tunis.' He was likewise a political writer in the Tory interest. In 1808 he edited a complete collection of his literary works, in eight octavo volumes; and this was almost his last contribution to literature. He died in Edinburgh, Jan. 14, 1831.

MACKEREL. [SCOMBRIDÆ.]

MACKINTOSH, SIR JAMES, was born at Aldourie, on the banks of Loch Ness, October 24, 1765. He received his education at the universities of Aberdeen and Edinburgh, came to London, and was called to the bar in 1795. In 1804 he went to India as recorder of Bombay. He returned to England in 1812; in 1818 he was appointed to the professorship of law and general politics in the college instituted for the education of the civil servants of the East India Company at Haileybury. In 1830, when the Whigs came into office, Sir James was appointed a commissioner for the affairs of India. He died May 30, 1832.

Sir James's principal works are his 'Vindiciæ Gallicæ,' his 'History of England' (which he left unfinished at his death); his 'Dissertation' prefixed to the 'Encyclopædia Britannica;' and his 'Life of Sir Thomas More.'

MACKLIN, CHARLES, according to the account of a female relative, 'was two months old at the battle of the Boyne' (July 1, 1690). He began life as a saddler's apprentice, but in his 21st year joined a strolling company as Harlequin, and pursued the vocation of an actor thenceforward with various fortune and occasional intermissions till 1789. He died in London, July 11, 1797. He was a clever actor, and was celebrated for his performance of Shylock. He also wrote several dramatic pieces, of which 'Love à la Mode,' a farce, and the 'Man of the World,' a comedy, yet retain possession of the stage.

MACKNIGHT, JAMES, D.D., born 1721, died 1800, was a clergyman of the church of Scotland, and of considerable eminence among the theological writers of the last century. He wrote 'A Harmony of the Gospels,' with copious illustrations, being in fact a life of our Saviour, embracing everything which the evangelists have related concerning him; and 'A new Translation of the Epistles.' Both these works were favourably received, and are by many persons highly esteemed.

MACLAURIN, COLIN, was born at Kilmoddan, in Argyleshire, in February 1698. The care of his education devolved upon an uncle, who sent him to the University of Glasgow at the age of eleven. It is said that in the following year, meeting accidentally with a copy of Euclid, he made himself master of the first six books in a few days, a story utterly incredible upon the mere statement. It is said also, and with much more likelihood, that at the age of sixteen he had invented many of the propositions afterwards published in his 'Geometria Organica.' However this may be, he took the degree of Master of Arts with distinction in the fifteenth year of his age (1713), and afterwards lived in studious retirement till the autumn of 1717, when, after a severe competition and ten days' examination, he obtained the professorship of mathematics at the Marischal College, Aberdeen. In 1719 and in 1721 he visited London, and formed the acquaintance of many eminent men, particularly of Newton.

In 1725 he was appointed to assist James Gregory, whose strength was declining, in the duties of his chair at Edinburgh. The want of funds to pay an assistant placed difficulties in the way of this arrangement, which were removed, but how is not clearly stated. We mention them here to record, in honour of Maclaurin, that Newton, on hearing of the obstacles, offered to pay twenty pounds a year, till Gregory's death, towards the assistant's salary, if Maclaurin were to be appointed. At Edinburgh he remained almost all the remainder of his life. When the rebellion broke out in 1745, he exerted himself vigorously for the existing government, and the hasty works which were thrown up for the defence of Edinburgh were planned and superintended by him: fatigue and exposure laid the foundation of a mortal disorder. When the Pretender entered Edinburgh, Maclaurin withdrew, to avoid making the submission which was demanded: but he had previously managed to introduce a good telescope into the castle, and to contrive a method of supplying the garrison with provisions. He accepted the invitation of Dr. Herring, archbishop of York, with whom he remained till it was safe to return to Edinburgh. Shortly after his return, he died of dropsy, June 14, 1746, aged 48 years.

The writings of Maclaurin are not numerous, but they have exercised considerable influence upon the mathematical studies of this country; more however, we think, in what has been taken from them, or on their model, by others, than in the extensiveness of their own circulation. There is both originality and depth in all of them.

1. The various papers which he published in the 'Philosophical Transactions' are on subjects intimately connected with his separate works.

2. 'Geometria Organica.'

3. In 1724 he gained the prize of the Academy of Sciences for an Essay, proposed by that body, on the Leibnitzian method of measuring the force of bodies in motion. In 1740 he divided with Daniel Bernoulli, Euler, and Cavallieri, the prize of the same academy for an essay on the tides. This work is printed in what is called the Jesuits' edition of Newton.

4. 'A Treatise of Fluxions,' Edinburgh, 1742 (2 vols. 4to.; a second edition about 1801, 8vo.). The immediate cause of this work was the attack of Berkeley upon the first principles of Fluxions, in his 'Analyst:' it is of great prolixity, as might be expected in an elementary treatise which is written entirely on the defensive; but it must always be remarkable as having been the first work in which the principles of fluxions were placed in logical connection with each other. Among other things is the theorem now known by the name of Maclaurin, but which had been previously noticed by Stirling.

5. 'A Treatise on Algebra,' 1748 (sixth edition, 1796).

6. 'An Account of Sir Isaac Newton's Philosophical Discoveries,' London, 1748. This work was published from the author's papers: the editor was Patrick Murdock. In the present day, when popular explanation of scientific points has been well studied, it would be easy to name works which are preferable to that of Maclaurin in matter and form; but in style it would be difficult to do the same. At a time when the theory of gravitation was hardly admitted by many at home, not yet received by any of note abroad, and really understood by very few, such a work was of peculiar value.

MACLE (*Chiastolite*) is a right rhombic crystal, composed of two substances; one of a yellowish white, sometimes translucent and of a glassy fracture; the other blueish black, opaque and dull.

MACLUREITE (*Condrodite, Brucite*) occurs imbedded in rounded masses, the larger of which present occasional crystalline appearances of rhombic prisms with dehedral terminations. It consists principally of silica and magnesia.

MÂCON, the *Matisco* of Julius Cæsar, the capital of the French department of Saône-et-Loire, is situated on the right bank of the Saône, in 46° 18′ N. lat., 4° 50′ E. long., 40 miles N. from Lyon, on the Paris-Lyon Railroad, now in course of completion, and has 12,820 inhabitants. The town stands on the slope and at the foot of a hill above the Saône, along the bank of which is a noble quay, from which the distant Alps may be seen. A green island occupies the centre of the stream opposite to the quay; and an ancient bridge of 12 arches connects the town with the suburb of St.-Laurent on the other side of the river, in the department of Ain. The streets of Mâcon are crooked, narrow, and ill paved: the houses are of stone, and substantially built. The ramparts of the town have been demolished and their site laid out in promenades. The former cathedral was ruined in the first Revolution, but the episcopal palace escaped, and is used for the prefect's residence. The chief public buildings are—the town-hall, which contains a theatre and public library; the general hospital, on the parade; the new church of St. Vincent; and the new prison. Among the Roman antiquities are a triumphal arch and the ruins of a temple of Janus. The inhabitants carry on a considerable trade in the wines of the district, corn, hoops, staves, cattle, &c. There are manufactures of blankets, leather, earthenware,

clocks, and watches. Mâcon is the seat of tribunals of first instance and of commerce; it has also a college, and a primary normal school.

MACON. [GEORGIA.]

MACPHERSON, JAMES, was born in 1738 at the village of Ruthven, in Inverness-shire. He studied at King's College, Aberdeen, and on leaving college he was appointed schoolmaster of his native village; and it was while holding this situation that he gave to the world what appears to have been his first publication, a poem entitled 'The Highlander,' in 1758. He afterwards became known for his enthusiastic love of the ancient poetry of Scotland, which he translated from the Gaelic, and published at different times between 1759 and 1763. He attributed these poems to Ossian, which occasioned a lively controversy among the learned of the day as to their genuineness. In 1771 he published, in one vol. 4to., a disquisition on the antiquities of the Scottish Celtic race, under the title of 'An Introduction to the History of Great Britain and Ireland;' in 1773 a prose translation of the 'Iliad' of Homer; in 1775 a 'History of Great Britain from the Restoration to the Accession of the House of Hanover,' in 2 vols. 4to., together with 2 vols. of 'Original Papers,' which last work he sold to the booksellers for 3000*l*. At last his appointment to the lucrative office of agent to the Nabob of Arcot turned his attention and pen to Indian affairs; and he was brought into parliament in 1780, as member for Camelford, for which he sat till 1790. He died February 17, 1796.

MACRA'SPIS (*MacLeay*), a genus of Coleopterous insects of the section *Lamellicornes*, and, according to Latreille's classification, belonging to the third division of that group, the *Xylophili*. The genera *Macraspis* and *Chasmodia* constitute two closely allied groups of the family *Rutelidæ*, the species of which inhabit the warmer parts of South America, and are remarkable for the large size of their scutellum.

The insects of these two genera fly by day about trees, emitting a humming noise, and feed upon flowers. Collections formed in Brazil usually contain many of these insects.

Dejean, in his 'Catalogue des Coléoptères,' enumerates twenty-six species of *Macraspis* and five of *Chasmodia*.

MACRAUCHE'NIA, Professor Owen's name for a large extinct Mammiferous animal, referable to the order *Pachydermata*, but with affinities to the *Ruminantia*, and especially to the *Camelidæ*.

The remains on which the professor founded this genus included two cervical vertebræ, seven lumbar vertebræ, all more or less fractured; a portion of the sacrum and ossa innominata; fragments of the left scapula, of the right radius and ulna, and right fore-foot; the right femur nearly entire, the proximal and distal extremities of the right tibia and fibula; and a metatarsal bone of the right hind-foot. These portions of the skeleton were discovered by Mr. Darwin in an irregular bed of sandy soil, overlying a horizontal accumulation of gravel on the south side of Port St. Julian, on the east coast of Patagonia, and belonged to the same individual.

(See *Zoology of the Voyage of H.M.S. Beagle*, 1839.)

MACRI'NUS, OPI'LIUS, a native of Mauritania, was præfect of the prætorium under Antoninus Caracalla, whom he accompanied in his expedition against the Parthians, and caused to be murdered on the march. [CARACALLA.] Macrinus was proclaimed emperor by the army, A.D. 217, and his son Diadumenianus, who was at Antioch, was proclaimed Cæsar; both elections were confirmed by the senate. Macrinus, after a battle with the Parthians near Nisibis, concluded peace with them. An insurrection, excited by Mœsa, the aunt of Caracalla, broke out against Macrinus, who, being defeated near Antioch, fled to Calchédon, where he was put to death, A.D. 218, after a reign of about fourteen months. He was succeeded by Elagabálus.

MACRO'BIUS, AMBRO'SIUS AURE'LIUS THEODO'SIUS, probably lived about the middle of the fifth century of the Christian æra. The place of his birth is uncertain; but he says, in his preface to the 'Saturnalia,' that the Latin language was not his mother-tongue.

Three works of Macrobius have come down to us: a commentary on the 'Somnium Scipionis' in the sixth book of Cicero's 'Republic;' 'Dialogues' which were supposed to have taken place during the Saturnalia at the house of Vettius; and a 'Treatise on the Latin and Greek Verb,' which however is imperfect.

The 'Saturnalia' is the most important and interesting of the works of Macrobius. Although written in indifferent Latin, and full of trifling absurdities, it contains much valuable information. It is divided into seven books.

The best editions of Macrobius are by J. Gronovius, Leyden, 1670; Zeunius, Leip., 1774 (which is said however, in the literary notices prefixed to the Bipont edition, to be very inaccurately printed); and the Bipont, 2 vols., 1788.

MACRODA'CTYLES, Cuvier's name for a family of Wading Birds (*Echassiers*) [GRALLATORES], which have very long feet, formed for running over marshy or water plants, or even for swimming, especially in those numerous species which have the feet fringed or bordered. There is not however any membrane between the bases of their toes, not even between those of the external ones.

The following genera are arranged by Cuvier under this family, which terminates his order *Echassiers*:—*Parra*, *Palamedea* (including *Chauna*), *Megapodius*, *Rallus*, *Fulica* (including *Gallinula* and *Porphyrio*), *Chionis*, Forst. (*Vaginalis*, Lath.), *Glareola*, Gm., *Phœnicopterus*. Cuvier's sixth order, *Palmipedes*, immediately succeeds this family, which is somewhat heterogeneous, and composed of birds whose habits are not similar. *Phœnicopterus* cannot be said to be without any membrane 'between the bases of the toes,' &c., for its anterior toes are united to the nails by a lunated membrane. [FLAMINGO.]

MACROOM. [CORK.]

MACROPO'DIANS, a tribe of brachyurous decapod Crustaceans, being the first of the family of *Oxyrhynchi* (Milne Edwards), and nearly co

responding with the genus *Macropus* of Latreille, remarkable for the enormous length of their feet, which has obtained for them the name of *Sea-Spiders.*

Habits, Food, &c.—The localities of the Macropodians are considerable depths in the sea, where they lie hid among the sea-weeds; they are also found on oyster-banks. They walk slowly and unsteadily. The weakness of their claws must render them not formidable to other marine animals, and the probability is that they live principally on *Annelids*, *Planariæ*, and small mollusks. (M. Edwards.) The genera are numerous.

MACRO'PUS, the scientific name for the Kangaroos. [MARSUPIALIA.]

MACROURA, or MACRU'RA, the scientific name for that section of Crustaceans which have the abdomen, usually called the tail, long, in contradistinction from that section (*Brachyura*) which have the tail short. The common lobster is an example of a macrurous crustacean, and the common crab of a brachyurous crustacean. [CRUSTACEA.]

MADAGASCAR (called by the natives Madecasse), a large island in the Indian Sea, about 240 miles (across the Mozambique Channel) from the coast of Mozambique on the eastern shores of Africa, extends from 12° S. lat. to 25° 45′ S. lat., and between 43° and 51° E. long. From north to south, between Cape Ambré or Natal, and Cape Mary or Romain, it is 960 miles long, with a width varying from 200 to 500 miles: it is estimated to cover a surface of 225,000 square miles. A mountain-range traverses the island in its whole length, and some of the summits rise to an elevation of 10,000 or 12,000 feet. Its offsets cover the greater part of the interior, and in some places approach to the very shores of the sea. In the interior the country in many places contains extensive plains, which are excellent pasture-ground, and frequently possess a soil adapted to all kinds of tropical plants.

Bambatooka Bay, on the western coast, is the estuary of several rivers. It is 17 miles in length, and three and a half wide at the entrance; but inside it is nearly eight miles wide. Bambatooka itself is an inconsiderable village, but Majunga, on the north side of the bay, is a large town and the harbour of Thanaan-arive, the capital of the Ovahs, the most powerful, industrious, and civilised nation of the island. Thanaan-arive is situated in 18° 56′ S. lat., and about 47° E. long., at an elevation of about 4000 feet above the sea-level. In 1817 it had more than 80,000 inhabitants, but has since much increased. It contains some well-built houses, and a few in the European fashion have been erected in modern times.

According to all accounts the climate of Madagascar is not so hot as might be expected from its geographical position. The elevated range in the interior, and the wind constantly blowing from the sea, render the heat supportable. Madagascar contains a very large proportion of fertile soil, and will produce nearly every kind of grain. Rice is the principal object of agriculture; but grain and fruits are cultivated in abundance, as are likewise sugar, pepper, tobacco, and coffee. Cattle, sheep, fowls, ducks, and geese are kept. Wild swine are numerous. Among the minerals are iron, tin, silver, copper, plumbago, and potter's clay.

The population is estimated to amount to between four and five millions. The inhabitants seem to belong to different races, which have mixed together, and speak only one language, which contains a great number of Malay words. The Ovahs and the inhabitants of the coast differ in stature, hair, and features; but both nations have made much progress in arts and agriculture. Their language is written in the Arabic character. Their religion is idolatry, not founded on any sacred writings; and missionary enterprise had made some progress among them, when it was checked by violent means in 1835.

Madagascar is said to be divided into twenty-two states, governed by kings; but in the present century most of them were subjected to the sway of the Ovahs, by King Radáma, who died in 1828. This extraordinary man, who in energy of character resembled Peter the Great, introduced into his country the arts and civilisation of Europe. He established a communication with the English in the island of Mauritius. He received and protected the missionaries, and promoted the establishment of schools, the number of which at the time of his death had increased to more than 100, in which nearly 5000 children were instructed. Several young people were sent to the Mauritius and even to England to receive instruction. European mechanics were well received and employed by Radáma. He introduced into his army the discipline and arms of the English. He was succeeded by his queen, who has since governed on entirely opposite principles.

The French alone have tried to establish colonies on this island. The first attempt was made in 1665, and several others were made afterwards. These settlements never prospered, partly on account of the unhealthiness of the low western coast, where they were formed, and partly on account of the warlike character of the inhabitants. Since the return of peace in Europe the French have again made some attempts in two or three places, which however have had but little success. The French and English trade a little with Madagascar; and some districts keep up a commercial intercourse with the southern coasts of Arabia.

MADDALONI. [LAVORO, TERRA DI.]

MADDER. [RUBIA.]

MADEIRA, an island situated in the Atlantic Ocean, between 32° 30′ and 32° 53′ N. lat., and 16° 40′ and 17° 20′ W. long., and about 400 miles from the north-western coast of Africa. It is nearly 45 miles long, and its greatest breadth nearly 20 miles. The area is 360 square miles.

This island is one mass of basalt, rising with a rather steep ascent from the south and from the north towards the interior, where Pico Ruivo, the highest summit, attains 5993 feet above the sea-level. Both declivities of the mountain-pass are furrowed by deep and generally narrow valleys and depressions, traversed by streams of clear water. These valleys contain the gardens and vineyards. The climate of Madeira is very mild;

and many persons in England who are suffering from or in danger of consumption withdraw to it for the purpose of diminishing their sufferings and prolonging their life.

In the lowest region of the island, to about 750 feet above the sea-level, many tropical plants are cultivated. Above this region, to a height of from 750 to 2500 or 2800 feet, the fruits and grain of Europe, especially wheat and maize, are raised; and in this region are also the extensive vineyards, which till recently furnished the most important article of exportation. Then follows a tract covered with high trees, which rises to 3200 feet and higher, where many plants and trees are found which do not occur in Europe; and above this level is a region of grass, fern, and heath. Few horses are kept, and most of them are imported. Cattle are more numerous, and of a large size. Asses are the most common domestic animals, and best adapted to the roads of the country as beasts of burden. Hogs are rather numerous, as well as fowls. In the interior there are many wild swine and rabbits. Birds are not numerous, and fish is rare, on account of the great depth of the sea which surrounds the island. Salted cod constitutes one of the most important articles of import.

Funchal, the capital, and the only town of the island, is on the southern coast. The town consists of a pretty wide street along the sea-shore, where there are several good buildings, and numerous small lanes, which extend to a considerable distance up the slope of the hill. The number of inhabitants is about 20,000. The town is defended by four forts, and has eight churches and several convents. In the midst of the town is an open square, planted with trees.

The population of the island is estimated at 80,000, who are descendants of the Portuguese, but with a considerable mixture of African blood. The number of negro-slaves is still considerable, and was formerly much greater. The inhabitants are a very industrious and enterprising people.

The commerce of Madeira is considerable. The exports consist chiefly of Madeira and Malvasia de Madera wines. Minor articles of export are, fruits, dragon's-blood, honey, wax, orchil, and tobacco, besides provisions for the vessels bound to more remote places. The imports consist of manufactured goods, corn, fish (herrings and cod), oil, salt-beef, salt, and some tropical productions. The imports into Great Britain from Madeira, in 1845, consisted mainly of 164,035 gallons of wine, and 109,287 lbs. of nutmegs. The British and Irish goods sent thither in the same year were valued at 27,507*l*.

Madeira is said to have been visited by Robert Machin, an Englishman, during the reign of Edward III. It was rediscovered in 1419 or 1420 by Gonzalves Zarco. Soon afterwards it was settled by the Portuguese, and the culture of sugar and wine was introduced. Sugar was grown to a considerable extent before the islands in the West Indies were settled; but upon that event the culture decreased, and was replaced by that of wine, which now seems to be giving way to coffee.

About 40 miles north-east of Madeira lies the small island of *Porto Santo*. It is a basalt rock, which does not exceed 500 feet in height. To the south-east are three small basalt rocks, lying in a row from north to south. They are called *Ilhas Desertas*, and are only inhabited by sea-fowl, but they are visited from Madeira for the purpose of collecting the orchil, with which the greatest part of their surface is covered.

MADISON, JAMES, was born March 5 (O. S.), 1751, near Port Royal, on the Rappahannock River in Virginia. He was educated at the college of Princeton in New Jersey, where, in 1772, he took the degree of B.A. In the spring of 1776 his political career commenced by his being chosen a member of the Virginia convention, which formed the first constitution of Virginia. He was appointed a member of congress in March 1780. He was one of the three commissioners from Virginia who assembled at Annapolis, where he met Alexander Hamilton, with whom he was afterwards so closely united in forming the new constitution, and from whom he was so widely separated in carrying it into execution. His services to the United States cannot be too highly estimated. After the American constitution was formed, he was its zealous expounder to the people. He carried it triumphantly through the legislature of Virginia in spite of a strenuous opposition. He was chosen a member of the first congress in 1789, and continued a member until 1797. He took an active part in the affairs of his country; and, though he often appeared politically in opposition to General Washington so great was the esteem of the latter for Madison that he intrusted him with the composition of his farewell address on his retirement from public life. In the struggle which succeeded the retirement of the general, Madison took an honourable and influential part, and, when Mr. Jefferson was elected president, he was appointed his secretary of state. He succeeded Mr. Jefferson as president in 1809. Under his administration war was declared against Great Britain, to which he was urged by Mr. Clay and some ardent spirits whose patience was exhausted.

After serving two terms, Mr. Madison retired to private life, in March 1817. In 1829, when the constitution of Virginia was submitted to revision he consented to serve as a member of the convention. He also acted as a visitor of the university of Virginia, and succeeded Mr. Jefferson as rector. [JEFFERSON.] Although Mr. Madison lived to the age of eighty-five, he had a very delicate constitution, and never enjoyed good health. He died June 28, 1836.

MADNESS. [INSANITY; LUNACY.]

MADOX, THOMAS. Of the personal history of Madox little is known. His first work appeared in 1702, entitled 'Formulare Anglicanum or a Collection of ancient Charters and Instruments of divers kinds, taken from the originals from the Norman Conquest to Henry VIII.' In 1711 he published his great work, entitled 'The History and Antiquities of the Exchequer of the Kings of England, in two periods from the Norman Conquest to the end of

reign of King John; and from the end of the reign of King John to the end of the reign of Edward II., taken from Records.' In 1726 Mr. Madox published his 'Firma Burgi, or an Historical Essay concerning the cities, towns, and boroughs of England,' taken from Records.' A posthumous work from the pen of Mr. Madox, entitled 'Baronia Anglica,' a history of the landhonors and baronies, and tenure in capite, verified by records, in which he corrects the errors into which Lord Coke and others have fallen in the use of these terms, appeared in 1736. The date of his death is not known. Mr. Madox held the office of historiographer royal.

MADRAS, Presidency. [HINDUSTAN.]

MADRAS, the capital of the British Presidency of Madras, in Hindustan, is situated on the eastern coast of Hindustan, in 13° 4′ N. lat., 80° 16′ E. long. In 1639 a factory was established here, and a fortress was built to protect it, which is named *Fort St. George*. This fortress was soon environed by a town, which has become the present city of Madras, and of which the population probably amounts to 300,000. There are also several populous villages in the neighbourhood.

The largest portion of Madras is called the Black Town, from its being inhabited by the native population. The Black Town is north of Fort St. George, and both are situated close to the shore, on a level site, with a large open space, called the Esplanade, between them. The Black Town contains many good streets, especially one very handsome street in which the Europeans reside; but the houses of most of the Europeans stand in large compounds, scattered over a great extent of ground in the rear of the fortress and Black Town, and are all shaded with trees, and surrounded by hedges of bamboo and prickly pear. Few of the houses have an upper story, and none have three stories. St. George's church is a large and beautiful structure, and the Government House, which adjoins the Esplanade, is also a handsome building. Madras contains several endowed public schools and charitable institutions.

The coast has no indentation, nor has Madras any harbour or pier. A heavy swell rolls in shore throughout the whole year, and vessels anchor in the open roads at the distance of a mile or two. Cargoes are loaded and unloaded by boats adapted for passing through the surf, and passengers are conveyed to and from the vessels on a sort of raft. [CATAMARAN.]

MADREPHYLLIŒA, the first section of the *Stony Zoantharia* of Blainville, who styles the other section of this family of *Zoantharia Madreporœa*. The Linnæan genus *Madrepora* included nearly all the species, and obviously required analysis, the more so that geological naturalists referred to the same genus a vast number of previously unknown forms, and thus encumbered recent and impeded fossil zoology, and prevented any right notion of the successive forms of zoophytic life on the globe.

Solander proposed some useful divisions of this unmanageable genus, derived from the growth of the coral; Lamarck established many important genera, especially characterising some fossil groups; Lamouroux also laboured to improve the classification. Of late years Goldfuss has described additional fossil groups; and M. de Blainville has reorganised the labours of his predecessors, with a special regard to the soft animal parts figured and described by Lesueur, Quoi, Gaimard, and other voyagers.

The *Madrephyllicea* of this writer seldom acquire that highly ramose figure which belongs to the Lamarckian genera *Madrepora*, *Pocillopora*, &c.; they are furnished with cells of various figures, always however radiated by lamellæ, which are frequently numerous. There is no general distinctive character of the soft parts or 'polypi,' as they have usually been termed.

MADREPORÆA, the second section of the *Stony Zoantharia* of De Blainville, and placed by him after *Madrephyllicea*.

The Corals of this section are generally arborescent, with small partially lamelliferous cells, and constantly porous in the interstices and walls of the cells. This last is the most important character. The Lamarckian genus *Madrepora* included many of the genera of De Blainville.

MADREPORITE, *Anthraconite*, *Columnar Carbonate of Lime*, is a grayish black translucent mineral, which occurs in roundish masses, and consists chiefly of carbonate of lime and carbonate of magnesia.

MADRID, Department of. [CASTILLA-LA-NUEVA.]

MADRID, the capital of New Castile and of Spain, and now also of the province of Madrid, stands on a range of small hills rising in the middle of the extensive plain of New Castile, which is bounded on the north by the mountains of Guadarrama, and on the south by those of Toledo, in 40° 24′ 18″ N. lat., and 3° 42′ W. long. Madrid is supposed to occupy the site of the Mantua Carpetanorum of the Romans. It was a frontier town in the time of the Moors, and was constituted the capital of Spain by Philip II. The city occupies an area about five miles in circumference, and is estimated to contain a population of about 200,000. It is more than 2000 English feet above the level of the sea. It stands on the left or eastern bank of the Manzanares, a small river, which is crossed by two majestic bridges, called Puente de Toledo and Puente de Segovia. The city is surrounded by a brick wall twenty feet high, which contains fifteen gates, mostly built of coarse gray granite.

The general aspect of Madrid from all the approaches is anything but inviting. The numerous fantastic spires of churches and convents, the tiled roofs of the houses, the sterility of the neighbourhood, and the total absence of good houses, pleasure-gardens, or other buildings which indicate the approach to a great city, give to the capital of Spain the most gloomy and forbidding appearance.

The interior however is not devoid of beauty. There are wide and well-paved streets, extensive and well-planted public promenades, fountains in many of the squares, gorgeous churches, and

handsome public buildings. The houses are large and well constructed. There are 42 squares, of which the principal are—that of the Royal Palace; that of Santa Catalina, where a beautiful bronze statue of Cervantes has been placed; the Puerta del Sol, where the five principal streets of Madrid meet; the Plaza de la Cevada, where criminals were formerly executed; and, lastly, the Plaza Mayor, which is the finest of all.

The royal palace of Madrid, though unfinished, is one of the finest royal residences of Europe. The interior is decorated in a style of costly magnificence. It has four fronts, 470 feet in length, and 100 feet high. The custom-house; the Casa de Correos (Post-office) in the Puerta del Sol; the palace called de Buena Vista, formerly belonging to the dukes of Alba, now converted into an artillery museum; the royal printing-office in the street of Carretas; and the palace of the Duke of Berwick—are among the public and private buildings which adorn the capital. Among the numerous churches and convents which fill the streets of Madrid, scarcely one can be mentioned as a specimen of a pure style of architecture. The public promenades are many; the chief are the Prado, the Retiro, and the Delicias.

Madrid contains a university, 9 academies, 4 public libraries, 3 museums, 3 theatres, an amphitheatre for bull-fights, and 33 public fountains.

The Museo, or Picture Gallery, is open to the public on Sundays and Mondays, and to foreigners on other days on producing their passports. In 1843 it contained 1833 pictures, among which were 62 by Velasquez, 46 by Murillo, 10 by Raphael, and a proportionate number by other great masters.

Charitable and benevolent institutions are numerous, and some are amply provided with funds; but, the management having always been in the hands of the clergy, the funds have been spent in building monasteries and churches, rather than applied to the charitable purposes intended by the donors.

Madrid has little manufacturing industry. A manufacture of porcelain and another of tapestry are both the property of the crown.

MADRIDEJOS. [Castilla-la-Nueva.]

MADRIGAL, in music, is an unaccompanied vocal composition, sometimes in three parts, but commonly in more. The Flemings invented the madrigal about the middle of the sixteenth century, and the Italians took it up shortly after. Palestrina, Marenzio, Conversi, and Ferretti, in Italy, and Morley, Weelkes, Wilbye, Bennet, John Ward, Orlando Gibbons, Dowland, and Ford, in England, were the chief madrigal writers of that century. The art has long been indebted to the Madrigal Society, a club which consists chiefly of amateurs, founded in London in 1741, and which, by zeal and perseverance, has succeeded in diffusing throughout the British Isles a taste for a species of music as delightful as it is scientific, and exactly suited to the choral societies already existing, or springing up, in all our great manufacturing and commercial towns.

MADURA. [Hindustan.]

MADURA, an island in the Eastern seas, separated by a narrow strait from the north-east coast of Java. Madura lies between 6° 58′ and 7° 30′ S. lat., and between 110° 20′ and 111° 50′ E. long. Its extreme length from east to west is 90 miles, and its mean breadth 17 miles. The island is politically divided into three districts, each of which is nominally under the government of a native chief, but the whole are subject to the authority of the Dutch governor of Java. The inhabitants, who reside chiefly in villages, amount to about 240,000. The religion of the Madurese is Brahminical, and the practice of widows burning themselves with the bodies of their husbands is prevalent.

The soil of Madura is fertile, and produces abundance of fine rice, part of which is exported to Java. Buffaloes and sheep are also bred for exportation, and a considerable quantity of cocoa-nut oil is also prepared for the same purpose; but the principal export trade of the island consists of salt, many cargoes of which are taken every year to Java, Sumatra, and Borneo.

MÆANDER. [Anatolia.]

MÆCE'NAS, CAIUS CI'LNIUS, belonged to the equestrian order, and was descended from an ancient Etruscan family at Arretium. We are ignorant of the place and time of his birth. He received a good education, and was well acquainted with the Greek language. He early became acquainted with Octavianus (Augustus Cæsar), and continued through his life an intimate friend and chief adviser of that emperor. While Augustus was engaged in opposing Sextus Pompeius, and also during many of his other wars, Mæcenas was intrusted with the charge of the city. Mæcenas is said to have dissuaded Augustus from his purpose of restoring the ancient Roman constitution, which Augustus however probably never seriously intended. He died B.C. 8.

Mæcenas was a great patron of literature; and it was principally owing to his assistance and support that Virgil and Horace were raised from indigence, and enabled to devote themselves to poetry. They were both admitted to his friendship, and Horace in particular lived on terms of intimacy with him. Mæcenas was a man of luxurious habits; and he lived in a magnificent house on the Esquiline Hill. He wrote several works, such as poems, tragedies, and a 'History of the Wars of Augustus.' The few fragments of these works have been published by Lion, Göttingen, 1824.

MAECIA'NUS, LUCIUS VOLUSIUS, a Roman jurist, who lived in the time of Antoninus Pius and Marcus Aurelius. He was one of the legal advisers of Antoninus, and one of the instructors of Aurelius in law. He was held in high estimation by Aurelius, as appears from a rescript of the Divi Fratres, in which he is styled their friend and a most careful student of the Civil Law. He was also a friend of the jurist Julianus. The writings of Maecianus, which are mentioned in the Florentine Index, are sixteen books on Fidei-commissa, and fourteen on Judicia Publica. There are 44 excerpts from Maecianus in the Digest. Maecianus is cited by Papinianus, Ulpianus, and Paulus.

MÆNU'RA, or MENU'RA, Dr. Shaw's and Dr. Latham's name for a single genus of birds, whose place in the system has occasioned some differences of opinion among ornithologists.

One species only is known, viz. *Mœnura superba, M. Lyra,* or *Lyrata,* Shaw, Latham; *M. paradisea,* Vieill.; *M. Novæ Hollandiæ.* The *Mœnura,* or Lyre-Bird of Australia, is, it must be confessed, a remarkable species; and we cannot wonder that some have placed it in the Insessorial order, near the Thrushes and Orioles (Temminck, Cuvier), while others have regarded it as a rasorial or gallinaceous bird (Vieillot, Vigors, Swainson, and others).

Lyre-Bird (*Mœnura superba*).

The Mœnura is decidedly not rasorial. It is a song-bird, in some respects, notwithstanding its size, allied to the wrens; in other respects to the thrushes, or Brèves (*Pitta*). Mr. Gould makes the *Menurinæ* a sub-family of the *Sylviadæ,* and we believe him to be correct in his opinion.

Speaking of the genus *Menura,* Mr. Gould says, 'It might have been expected that the various explorations which have of late years been made into the previously unknown regions of Australia would have led to the discovery of some additional species of this genus, or of some new form more nearly allied to it, than those with which it is associated; but nothing of the kind has occurred. This remarkable bird is not only confined to Australia, but exclusively to the south-eastern part of the country. I regret to say that I have not been able to gain any further information respecting its nidification, although I have urged many persons in Australia to pay particular attention to the subject.' (Gould, in 'Introduction to the Birds of Australia,' p. 45; see also Gould's 'Birds of Australia,' vol. iii. pl. 14.)

MÆRA, Dr. Leach's name for a genus of amphipodous crustaceans.—Example, *Mœra grossimana,* Leach (*Cancer Gammarus grossimanus,* Montagu). 'Linn. Trans.,' ix. tab. 4, fig. 5. Very common on the English coasts, where it is found under stones and rocks at low water.

MAESTLIN, MICHAEL, a German astronomer, born about the year 1542, probably at Tübingen, in Würtemberg, at the university of which place he held the appointment of professor of mathematics. While resident in Italy he became acquainted with Galilei, whose conversion from the doctrine of Ptolemæus to that of Copernicus is partly attributed by some authorities to the arguments adduced by Maestlin in favour of the latter. Upon his return to Germany he became tutor to Kepler, to whom he behaved with marked liberality. Maestlin died at Tübingen in 1590.

MAFFE'I, SCIPIONE, Marquis, was born at Verona in 1675. He was educated in the college of Parma, and served in the Bavarian army during the war of the Spanish succession. His principal works are—'La Merope,' a tragedy, the first written in Italian which deserves the name; 'Verona Illustrata,' a very valuable work; 'Trattato dei Teatri antichi e moderni,' a defence of the stage; and 'Galliæ Antiquitates.' In union with Vallisnieri and Zeno, Maffei also originated the first literary journal which appeared in Italy, 'Giornale dei Letterati,' begun in 1710, and which was continued till 1730. Maffei died at Verona in the year 1755.

MAGADOXO, a town on the eastern shores of Africa, on the coast of Ajan, is situated in 2° 30′ N. lat. and 45° E. long. The harbour is formed by a long coral reef, and the town is divided into two parts, Umarween, and Chamgany, but the latter consists entirely of tombs. Umarween contains about 150 stone houses, built in the Spanish style. It carries on some commerce with Arabia. Its exports are ivory, gum, and a particular kind of cloth; it imports sugar, dates, salt fish, arms, and slaves.

MAGALHAENS, FERNANDO, incorrectly called *Magellan,* was born about 1470, in some place in Alemtejo. He is celebrated for his intrepid expedition, under the patronage of the Spanish crown, to America, when he was the first to discover, in 1520, the strait which bears his name, and the Ladrones and Philippine Islands. At the latter group he died in a skirmish with the natives in 1521. An account of the voyage was written by Pigafetta, who had accompanied him, which, except some extracts, remained unpublished till 1729, when it was given to the public in Italian and in French, by M. Amoretti.

MAGALHAENS, STRAIT OF, commonly called the *Strait of Magellan,* is the most extensive known strait on the surface of the globe. Its length in a straight line is above 200 miles; but, if the three great bends are taken into the account, it is rather more than 300 miles. It divides the continent of South America from Tierra del Fuego. The eastern entrance is formed by Cape de las Virgines on the continent and by Cape del Espiritu Santo, or Queen Catherine's Foreland, which is on King Charles's Southland, the largest of the islands composing Tierra del Fuego. At its western entrance are Cape Pillar to the south, on the island

of South Desolation, and Cape Victory to the north, on a small island belonging to Queen Adelaide's Archipelago. The most northern bend of the Strait approaches 53° 10′ S. lat., and the most southern inlet, called Admiralty Sound, 55° S. latitude. The eastern extremity of the strait is situated in about 68° 20′ W. long., and the western in about 74° 40′.

The Strait of Magalhaens was discovered by Fernando Magalhaens in 1520. It was formerly much navigated by vessels bound for the harbours on the western coast of America; but the navigation was always dangerous and tedious, in consequence of the all but continuous western gales, the great strength and irregularity of the currents, the numerous rocks and cliffs in the western part of the strait, and the great humidity of the climate, which engenders scurvy and other diseases. At present a vessel rarely enters the strait unless sent by some government for a special purpose.

(*London Geogr. Journal*, vol. i.)

MAGAZINE, a strong building, constructed generally of brick or stone within a fortified place, or in the neighbourhood of a military or naval station, in order to contain in security the gunpowder or other warlike stores which may be necessary for the defence of the place, or for the use of the troops who are to perform military duty in the province or district. [Bomb-Proof; Casemate.]

The buildings in which gunpowder is contained are constructed with every precaution necessary to insure dryness. They are generally in places remote from other buildings; they are furnished with metallic conductors, in order to avert danger from lightning; and, for security against the attempts of ill-disposed persons, they are surrounded by a wall and ditch. When in situations where they may become the objects of hostile measures, they are made shell-proof.

The great magazines which have been constructed in this country consist of several parallel vaults, separated from each other by brick partition-walls, in which are doorways for affording lateral communication. Each vault is about 90 feet long, 19 feet wide internally, and from the floor to the crown of the arch 19 feet high. The side walls are from 8 to 10 feet thick, and are strengthened by buttresses built at intervals against them. The concave or interior surface of each vault, in a vertical and transverse section, is nearly of a parabolical figure, above the springing courses; and the exterior surface has the form of two inclined planes meeting in a longitudinal ridge-line above the middle of the vault. The thickness of the brickwork forming the vaulted roof is therefore various: at the crown it is 7 or 8 feet, and on the hances about 3 feet, this being considered sufficient to resist the shock of falling shells.

MAGDALEN COLLEGE, Oxford, was founded in 1456, by William of Waynfleet, bishop of Winchester and lord high chancellor of England, for a president, 40 fellows, 30 scholars called *Demies*, a schoolmaster, an usher, 4 chaplains, an organist, 8 clerks, and 16 choristers. The visitor is the Bishop of Winchester. The patronage of this college consists of rectories and vicarages in different counties, with two perpetual curacies, 37 in number. The number of members upon the college books in 1848 was 186.

Magdalen College stands upon a plot of ground at the entrance of Oxford from London bounded on its east side by the Cherwell. The buildings are extensive. The entrance-court leads into a larger quadrangle, which contains the chapel, hall, and library. South of the chapel and on the south side of what is called the Chaplain's court stands the tower of the college, the beautiful proportions of which render it one of the chief ornaments of Oxford. The great quadrangle was begun by the founder in 1473, though not finished till after his death. The foundation of the tower was laid in 1492. The foundations of what are called the New Buildings of this college, on the north side of the great quadrangle, were laid in 1733. The chapel, which had been refitted and decorated in an incongruous manner in the time of Charles I., was restored to its former magnificence under the direction of Mr. Cottingham in 1833.

MAGDALEN HALL, Oxford. The school, with the refectory and chambers erected by Bishop Waynfleet for students previous to admission into his college, and adjoining its buildings, obtained the appellation of St. Mary Magdalen Hall as early as 1487, and was governed by one of the Fellows till 1602, when it became an independent Hall. The President and Fellows of Magdalen College, being desirous of recovering this site, obtained, in 1816, an act of parliament which authorised them to prepare for the reception of this society Hertford College, which had lapsed to the crown, and the Principal and other members removed there on its completion in 1822. The number of members on the books in 1848 was 221.

MAGDALENE COLLEGE, Cambridge, was built by Edward Stafford, Duke of Buckingham, in the year 1519, under the name of Buckingham House, on the site of an ancient hostel belonging to the abbeys of Ely, Ramsey, and Walden. The Duke of Buckingham not having completed the building at the time of his attainder, the college fell to the crown, and was granted to Thomas, Lord Audley, lord high chancellor of England, who in 1542 endowed it for a master and 4 fellows.

Besides the foundation fellowships left by Lord Audley, this college has 13 bye-fellowships, and there are also 43 scholarships founded by different benefactors.

This College, which stands on the north side of the Cam, consists of two small courts. On the north side of the second is a stone building, the body of which is appropriated to the reception of the Pepysian Library. This library was bequeathed to the college by Samuel Pepys, Esq., Secretary of the Admiralty in the reigns of King Charles II. and King James II. The number of members on the boards of this college in 1848 was 217.

MAGDALENA, River. [Granada, New.]

MAGDEBURG, one of the three governments of the Prussian province of Saxony. Its area is 4446

square miles, and the population in 1847 was 674,149. The government is divided into fifteen circles. The country is one of the finest parts of the Prussian monarchy, consisting chiefly of a fertile and level tract; the hills in the south-west, which are offsets of the Harz, are low, and in other parts the surface is merely varied by gentle elevations.

Magdeburg, the capital of the government and of the province of Prussian Saxony, and one of the strongest fortresses in Prussia, stands on the left bank of the Elbe and an island formed by its arms, in 52° 8′ N. lat., 11° 39′ E. long., 90 miles by railway S.W. from Berlin, and has a population of 55,000. The town consists of three parts, called Altstadt, Neumarkt, and Friedrichs-stadt; and of two suburbs, Sudenburg and Neustadt. It is ill built, with narrow, crooked streets. The most remarkable buildings are—the noble cathedral, which was completed in 1363, the town-hall, the government house, the artillery barracks, and the theatre. Of the squares the largest are, the old market-place, in which is a statue of Otho the Great; and the cathedral square, which is surrounded by handsome buildings and avenues of trees. The town has numerous charitable, literary, and scientific institutions, schools, libraries, and picture galleries. It has also manufactures of silk, broad cloth, leather, gloves, tobacco, jewellery, pottery, beer, spirits, &c. A canal runs from the Elbe at Magdeburg to the Havel; steamers ply daily to Hamburg. Magdeburg is rich in historical associations; the most celebrated event in its annals is its capture by storm (May 10, 1631), by the Austrian general Tilly.

Aschersleben. [Aschersleben.]

Burg, 15 miles N.E. from Magdeburg, on the railroad to Berlin, is a busy manufacturing town of 14,000 inhabitants, most of whom are employed in the cloth and tobacco factories.

Halberstadt, an old town with about 18,000 inhabitants, stands on the Holzemme, 27 miles S.W. from Magdeburg, and has manufactures of woollen cloth, hosiery, tobacco, and leather. The chief buildings are the cathedral; the church of Unsere Liebe Frau, which is built in the Byzantine style, and dates from 1005, but is now not used as a church; the town house; and the theatre.

Quedlinburg, a walled town, the birthplace of Klopstock, stands on the Bode, 30 miles S.W. from Magdeburg, and has 13,000 inhabitants, who manufacture beet-root sugar, spirits, and woollen cloth. This place was long famous for its convent, the superioress of which was in spiritual matters subject to the Pope only, was a princess of the empire, and had a vote in the diet. At the Reformation the abbess embraced the Lutheran religion, and the institution continued, but with greatly diminished means, till 1802, when the convent was sequestrated. The abbey church is a fine building, and interesting on account of the tombs it contains; among these are the tombs of the Emperor Heinrich I. and his wife Matilda.

Salzwedel, a walled town 40 miles N.W. from Magdeburg, stands on the Jetzel, which divides it into the Old and the New Town. It has 6 churches, 2 hospitals, a gymnasium, and 7285 inhabitants, who manufacture woollen stuffs, gloves, needles, beer, spirits, &c.

Schönebeck, 7 miles S.S.E. from Magdeburg, stands on the left bank of the Elbe, and has important salt-works and 7400 inhabitants, who manufacture tobacco, leather, chemical products, gloves, &c.

Stendal, a walled town, entered by 5 gates, stands on the Uchte, 32 miles N.N.E. from Magdeburg, and has 6100 inhabitants, engaged in the manufacture of cloth, calico, and leather.

MAGELLAN. [Magalhaens.]

MAGGIORE, LAGO. [Lago Maggiore.]

MAGHERAFELT. [Londonderry.]

MAGI, the name of the priests among the Medes and Persians. The Magi formed one of the six tribes into which the Medes were originally divided (Herodot. i. 101); but on the downfal of the Median empire they continued to retain at the court of the Persian conquerors a great degree of power and authority.

MAGIC LANTERN is a species of lucernal microscope, its object being to obtain an enlarged representation of figures on a screen in a darkened room, by means of the pencils of light issuing from a lamp or candle and passing through a convex lens.

The instrument consists of a lantern, generally of tin, and of a cubical form, in the interior of which is the light; and at a perforation in one of the sides is applied a tube, projecting horizontally from it, which carries two glass lenses.

A groove in front of the lantern and parallel to that front receives a rectangular frame containing the glass plates on which are painted, with transparent colours, the objects of which an enlarged view is to be obtained; and, as the amusement of young persons is chiefly intended by the exhibition, grotesque figures are usually those which are represented.

A remarkable improvement in the manner of employing the magic lantern was first exhibited in London in the year 1802. The lantern itself is similar to but larger than that which serves for more general purposes, and the images are represented on a transparent screen, which is stretched in a vertical position across a theatre or an apartment; and, this being made quite dark, the spectators occupy the space in front of the screen, while the apparatus is disposed on the opposite side.

All light is excluded both before and behind the screen, except that which, in proceeding from the lantern, produces the image to be observed; and, the screen being itself invisible, the spectators can scarcely divest themselves of the idea that they are looking into a dark cavern, in which the objects appear to be gradually advancing towards or receding from them. The illusions produced have caused the name of *Phantasmagoria* to be applied to the apparatus.

MAGIC SQUARE. This term is applied to a set of numbers arranged in a square in such a manner that the vertical, horizontal, and diagonal columns shall give the same sums. Such arrangements were known very early to the Hindoos, Egyptians, and Chinese, among whom, as also among the Europeans of the middle ages, a belief

existed that such squares had astrological and divinatory qualities. Emanuel Moschopulus, of Constantinople, wrote on them in Greek in the middle of the 15th century. (See Montucla's 'History,' vol. i. p. 346; 'Encyclopédie Méth.,' art. 'Quarrés Magiques;' Hutton's 'Dictionary;' and the 'Mathematical Recreations' of the same author.)

The following are samples of a magic square of 16 numbers:—

1	16	11	6
13	4	7	10
8	9	14	3
12	5	2	15

4	11	14	5
6	13	12	3
9	2	7	16
15	8	1	10

13	4	5	12
16	6	11	1
3	9	8	14
2	15	10	7

16	3	10	5
8	2	13	11
9	15	4	6
1	14	7	12

8	12	5	9
11	1	16	6
13	7	10	4
2	14	3	15

8	10	3	13
15	1	12	6
9	7	14	4
2	16	5	11

8	12	5	9
10	1	16	7
13	6	11	4
3	15	2	14

10	11	5	8
15	2	16	1
6	7	9	12
3	14	4	13

The methods which have been given for the formation of magic squares are divided into different rules, according as the number in each side is odd, evenly even, or oddly even. A general method which shall apply to all cases is yet wanting. For a full account of these rules see Hutton's *Mathematical Recreations*.

MAGI'LUS, De Montfort's name for a genus of testaceous mollusks, the form of whose shell varies very much, according to its different stages of growth, and the circumstances in which it is placed. Example, *Magilus Antiquorum*.

MAGINDANAO. [PHILIPPINES.]

MAGISTRATE, a word derived from the Latin *magistratus*, which contains the same element as *magnus* and *magister*, and signifies both a person and an office. A Roman magistratus is defined to be one who presides in a court and declares the law, that is, a judge. The kings of Rome were probably the sole Magistratus originally, and on their expulsion the two consuls were the Magistratus. In course of time other offices, as those of Praetor and Aedile, were created; and those who filled these offices were elected in the forms prescribed by the constitution. The original notion of a magistratus, then, is one who is elected to an office, and has jurisdiction.

In England the term magistrate is usually applied to justices of the peace in the country, and to those called police magistrates, such as there are in London. It has also been applied in other ways; for instance, people have sometimes said that the king is the chief magistrate in the state. But these applications of the term do not agree with its proper sense. A Roman magistratus was elected, and so far he differed from an English justice of the peace; he also exercised delegated power in his jurisdiction, in which respect, as well as being elected, he differed from the King of England, who is not elected, and does not exercise delegated jurisdiction, but delegates jurisdiction to others.

MAGLIABE'CCHI, ANTO'NIO, born at Florence in 1633, was an indefatigable reader, and had a prodigious memory. He employed his scanty savings in buying books, and gradually collected a vast library, which since his death has become the property of the city of Florence, and is open to the public, and known by the name of Magliabecchiana. Magliabecchi left no work of his own. Some of his letters have been published in various collections. He died at Florence, in 1714, at eighty-one years of age.

MAGNA CHARTA. If the Magna Charta granted by King John did not properly found the liberties which the English nation enjoys, or if it was not the original of those privileges and franchises which the barons (or the chief tenants of the crown, for the names are here equivalent), ecclesiastical persons, citizens, burgesses, and merchants enjoy, it defined them, it formed in its written state a document to which appeal might be made, under whose protection any person who had any interest in it might find shelter, and which served, as if it were a portion of the common law of the land, to guide the judges to the decisions which they pronounced in all questions between the king and his subjects.

Besides the great charter there was granted at the same time a charter relating to the forests only. The rights of the church were also secured by the great charter.

The provisions of the Magna Charta are numerous, and some of them have fallen into desuetude. The substance of the Great Charter is given by Blackstone in his 'Commentaries,' who also wrote a treatise on it.

King John was compelled to grant the Charter by an armed force, consisting of a very large portion of the baronage, which he was unable to resist. The Charter was sealed in the open field, at a place called Runnymede, between Windsor and Staines. The memorable day was June 5, 1215.

The late Board of Commissioners on the Public Records caused to be engraved and published an exact fac-simile of the charter, from a copy preserved in the archives of the cathedral church of Lincoln, with others of the greater charters. In the first volume of their work, entitled 'The Statutes of the Realm,' these charters are all printed, with English translations of them.

MAGNA GRÆ'CIA, or MAJOR GRÆCIA, a term used to designate the south of Italy, which contained many flourishing Greek colonies. It does not appear to have been applied to the country north of Cuma and Neápolis.

The time in which the name of Magna Græcia was first applied to the south of Italy is uncertain. It is used by Polybius and subsequent Greek and Roman writers.

MAGNE'NTIUS, commander of the Roman

army in Gaul, revolted against Constans, son of Constantine the Great, and emperor of the West, and caused him to be killed near the Pyrenees, A.D. 350. Constantius, the brother of Constans, and emperor of the East, marched against Magnentius, and a battle was fought between them on the banks of the Drave, A.D. 351. Magnentius, being defeated, fled to Italy, whence he escaped into Gaul, where Constantius followed him, and defeated him again, A.D. 353. Magnentius, being forsaken by his troops, killed himself; and his brother Decentius, whom he had made Cæsar, followed his example. Constantius thus became sole master of the empire.

MAGNESIA. [MAGNESIUM.]

MAGNESIA, *Medical Properties of.* Oxide of Magnesium, termed also, from the mode of procuring it, Calcined Magnesia, or *Magnesia usta*, is an alkaline earth, possessing the usual qualities of alkalies in their habitudes with acids, and likewise the peculiar property of exciting generally purgative action of the intestines. This last-mentioned power gives it a distinctive character among alkaline remedies, as it can be employed not merely to counteract acidity, but also to remove the exciting cause when that consists in the presence of crude or undigested acid-yielding materials in the stomach. Its action as a purgative seems mainly to depend upon its meeting with acids in the stomach, and so forming soluble salts. When these are not present, the magnesia remains undissolved, and if used repeatedly may accumulate in the intestines, and, becoming agglutinated by the mucous secretions, give rise to much uneasiness. When however acidity exists, either along with constipation or diarrhœa, more particularly in children, from the milk disagreeing, or from a diet unsuited to their delicate organs of digestion being forced upon them, magnesia is a very proper medicine, especially as it appears to possess a specific power of diminishing gastro-intestinal irritation. It is generally expedient to add rhubarb to it, and combine it with some carminative. In such a state of combination it is peculiarly useful in what is termed diarrhœa crapulosa, arising from too great a mixture or too large a quantity of food.

Sulphate of Magnesia, or *Epsom Salts*, in the ordinary form, as met with in the shops, are small acicular crystals. This renders them liable to be confounded with those of oxalic acid, to avoid which the sulphate may be dissolved, and by re-crystallisation they are obtained in large four-sided prisms, or four-sided pyramids.

Sulphate of Magnesia is a convenient antidote in cases of poisoning by the salts of lead or barytes.

MAGNESIA ALUM, *Magnesian Pharmacolite*, and *Magnesite*, are three naturally formed minerals, in which magnesia is a chief element.

MAGNESIAN LIMESTONE, a component element in the new red sandstone system. This rock is seen to greatest perfection in England between the rivers Tyne and Tees, between the rivers Wharf and Dun, and between this last river and Nottingham. Its mode of aggregation varies extremely. In many situations (Thorp Arch, in Yorkshire) it is a soft powdery stone traversed nevertheless by veins of calcareous spar; about Tadcaster, and generally between the Nid and the Dun, it is a firm though hardly compact rock, often traversed by sparry veins and full of irregular crystallised cavities. The crystals are generally carbonate of lime, sometimes mixed with oxide of iron. Farther south the stone becomes more crystalline in its character. The general colour of the magnesian limestone (lower portion) is white, yellow, rich pale brown, or reddish. The upper rock is commonly of a gray, smoky, or purplish hue, and is usually interstratified with thin clay partings; the lower one very rarely.

Professor Sedgwick has pointed out clearly the most common organic fossils of this rock. We shall only observe here that, in respect of fishes (Palæonisci, &c.), mollusca (Producta, Spirifera, &c.), and zoophyta (Retepora, &c.), this rock shows an extreme analogy with the carboniferous system. Its place, by mineral analogies, may be rightly fixed in the pœcilitic system; but, by the affinities of organic existence, it will be classed with the more ancient rocks.

MAGNE'SIUM, a peculiar metal, of which magnesia is the oxide. Its existence was first demonstrated by the electro-chemical researches of Sir H. Davy. Magnesium is of a white colour, like silver; its lustre is metallic and brilliant; it is very malleable, and fuses at a red heat. When heated to redness in the air or in oxygen gas, it burns brilliantly, and, combining with oxygen, becomes magnesia. In chlorine gas it burns spontaneously.

Oxygen and *Magnesium* ($M^1\ O^1$) form the oxide, or Magnesia. It is colourless, inodorous, and tasteless, if pure; it is very nearly insoluble in water, although when moistened it exhibits the alkaline property of turning vegetable yellows brown. *Chlorine* and *Magnesium* ($Ch^1\ M^1$) form a transparent colourless mass; it is inodorous, intensely bitter, very deliquescent, and soluble both in water and alcohol. This salt is one of the saline ingredients of sea-water. *Bromine* and *Magnesium* form small acicular crystals, which have a sharp taste, are very deliquescent, and soluble both in water and alcohol. *Fluorine* and *Magnesium* unite when magnesia is dissolved in hydrofluoric acid. The compound formed is insoluble in water, or in hydrofluoric acid, and is not decomposed by a red heat. *Iodine* and *Magnesium*.—A compound of these is obtained when magnesia is dissolved in hydriodic acid; it is very soluble in water, and known only in solution.

Magnesia, or *Oxide of Magnesium*, combines with most acids to form salts, and also forms a *hydrate*. This hydrate is a saline compound, white, with a greenish tint, foliated, and easily splits into thin flexible laminæ. It has a pearly lustre, translucent on the edges. It is composed of about 31 water and 68 magnesia, with a little oxide of iron and manganese. *Nitric Acid* and *Magnesia* readily combine, and yield nitrate of magnesia ($Acid^1\ M^1$). The solution is colourless, and extremely bitter. *Carbonic Acid* and *Magnesia* form carbonate of magnesia ($Acid^1\ M^1$). It has a yellowish white colour, with a flat conchoidal and sometimes earthy fracture. It is

opaque and very difficult to break. It combines with the hydrate to produce the carbonate of magnesia used in medicine. *Sulphuric Acid* and *Magnesia* constitute the salt long and well known by the name of *Epsom Salts*, having been first obtained from a spring at that place. *Sulphate of Magnesia*, which is its proper name (Acid^1 M^1 Water^7), is a salt which crystallises very readily. It is extremely bitter, readily soluble in cold water, which dissolves an equal weight, and boiling water one-third more. It is but slightly altered by exposure to the air, yet is rather inclined to effloresce. It is extensively employed as a purgative, and for the preparation of magnesia and its carbonate. *Phosphoric Acid* and *Magnesia* combine to form a crystalline phosphate (Acid^1 M^1 Water^7).

MAGNET (derived from the Greek *μάγνης*) is a metallic body possessing the remarkable property of attracting iron and some other metals. It is said to have been found abundantly near Magnesia in Lydia, from which circumstance its name may have been derived. The attracting power of the magnet was known at a very early period, as references are made to it by Aristotle, and more particularly by Pliny. When found native, it is generally a heavy ferruginous ore of a dull grayish colour, but the ores of cobalt and nickel also frequently possess the magnetic properties.

The universal law, that reaction is coexistent with action, implies, that iron must react on the magnet; and it is evident that all the iron in the mass of the earth must act upon a magnet. It is also now known that electrical currents influence magnetic bodies [Electro-Magnetism], while heat has an influence on magnetic intensity. Hence it follows as a mechanical consequence, that if a magnetic needle or cylinder be suspended by its centre of gravity, so as to be free to move in any direction round that point, it will not take an arbitrary position like unmagnetised bodies, but must take a specific direction, namely, that which represents the resultant of all the magnetic forces to which it is subject. [Declination of the Magnetic Needle; Inclination.]

One essential property by which a magnet differs from soft iron under the magnetic influence is this:—If we separate a magnetic bar into any number of minute parts, each such part will be endowed with polarity, similar to the whole; the position of those poles, or foci of greatest attraction, is permanent in a magnet of a given form; but in soft iron it will change when the distance of the iron from the influencing magnet is altered. [Magnetism; Magnetic Intensity.]

During a thunder-storm, the poles of a magnet are frequently inverted; and the appearance of the aurora borealis is often attended with vibrations of the compass-needle, to the extent of several degrees. The actual mode in which the aurora is produced being unknown, it is impossible to decide whether the aurora is itself the cause of this magnetic phænomenon, or whether both are attributable to some unknown common cause.

MAGNETIC INTENSITY. When a magnetic needle is freely suspended by its centre of gravity, it is then acted on by all terrestrial bodies containing the magnetic fluids. The direction of the resultant of all such forces in the earth may be regarded as possessing parallelism throughout the extent of the needle, and the latter acquires in consequence a like direction in the plane of the magnetic meridian, of which the position becomes in this manner known.

When a magnet is brought near a needle thus suspended, if the number of vibrations performed by the latter in a given time be observed, it will be found, by an investigation similar to that which is used for a common pendulum, that the intensities of the attractive and repulsive forces vary inversely as the squares of the distances; but it is now known that those intensities become inversely proportioned to the distances simply, when the distances are less than one-eighth or one-fourth of an inch. For the action of the earth on a suspended needle, see Terrestrial Magnetism.

The balance of torsion has occasionally been used to discover the relative intensities of magnetism as distributed in bodies; in straight and narrow laminæ it has been found by Coulomb to be nearly proportional to the square of the distance from the middle point.

MAGNETISM. If we take a natural or artificial magnet, and, spreading over a piece of paper a quantity of fine iron filings, place the magnet on the paper, on taking it up, we shall find that the iron filings are attached to it in some degree over all its surface, but they will be principally accumulated at two points situated near the ends of the magnet; these points are called the poles of the magnet. Sometimes, when a magnetic bar is rolled amongst iron filings, we may find several such points along the bar; the magnet is then said to have consecutive points. When a magnetised needle is suspended horizontally on a pivot armed with agate, it assumes a particular direction, nearly north and south. The pole N, at the north extremity of the needle thus adjusted, is commonly called the north pole of the needle; the other, S, the south pole; though the contrary names would be more correct in connection with the theory of magnetism.

If we now bring a piece of soft iron near the pole N, it will be attracted to that pole and become attached to it, so that the exertion of a mechanical force is necessary to separate them. In this way a magnet held vertically will sustain a piece of iron, provided the weight of the iron does not exceed the magnetic force. The pole S has a similar attractive power on iron; the cause of this attractive power is called *Magnetism*.

The force of magnetism is exerted without alteration through substances which are not magnetic, and the same is true with respect to the electrical forces when non-conducting bodies are interposed in the direction of their action. On the other hand, the effect of the magnetic forces is considerably modified when substances which are capable of becoming magnetic by influence are situated near the magnet; and a similar effect takes place by the decomposition of the neutral electricities when under the influence of an electrised body. [Electricity.]

In order to observe the action of magnets on each other, make two magnets or magnetic needles to float on water, distinguishing the poles of one by N and S, and of the other by N′ and S′. Bring either the pole N near to N′, or S to S′: the needles or magnets will separate to a greater distance, and with the greater energy the nearer these poles are placed to each other. On the contrary, if we bring N and S′ near each other, the needles will approach and unite those points; and the same happens when the points N′ and S are made contiguous: hence this law—*magnetisms of the same name are mutually repulsive; those of contrary names are mutually attractive.* In the article ELECTRICITY, it has been shown that the same law is true with respect to the two electricities.

The magnetism predominant at the north pole of a needle is called *Austral Magnetism*, and that which predominates at the south pole is termed *Boreal Magnetism*. The quantities of the austral and boreal magnetic fluids in all magnetic bodies are equal; for, when we bestow magnetic qualities on iron or steel by the influence of loadstones, hammering, sudden cooling in the magnetic meridian, &c., no new magnetism is communicated; but the natural magnetisms, which previously neutralised each other, are now decomposed. Again, if a magnetic needle be freely suspended by its centre of gravity, the action of terrestrial magnetism produces no linear motion, but only imposes a direction on the magnetic axis; now all the boreal fluid in the globe attracts all the austral fluid of the needle, and *vice versâ*, while the like fluids in both repel: hence a motion of progression would be generated, unless the resultant of the repulsive forces on the needle was exactly equal and of an opposite direction to the resultant of all the attractive forces; and the rotatory motion of the needle shows that the points of application of these forces are different; but the intensity of terrestrial magnetism may be regarded as uniform throughout the extent of the needle, and its direction parallel. In order, therefore, that the resultants should be equal and contrary, the sums of the boreal and austral forces of the needle must be equal. In this respect magnetism resembles the natural electricities of all substances.

If we place a bar of soft iron, suspended by a collection of silk strings at its middle, in a direction parallel to the magnetic axis of the dipping-needle, the action of terrestrial magnetism will have full effect on the bar, its natural magnetisms will be decomposed, and it will acquire a polarity similar to that of the needle, its poles repelling the similar poles of the needle, and attracting the contrary poles. If the bar be left for a long time in the direction of the magnetic axis, so as to acquire some oxygenation, or if it be heated to a red heat and suddenly cooled by immersion in water, it will acquire a coercive force, and become permanently magnetic. Iron crosses, weathercocks, &c., which have been long kept in a fixed position, or have been struck by lightning, acquire magnetic properties in the manner above described.

It is a remarkable circumstance connected with the change of molecular disposition caused by the action of heat, that, if we gradually heat a bar of iron, the intensity of its action on a magnet increases, and arrives at a maximum when the bar is brought to a cherry-red heat; with higher degrees of heat the intensity is diminished, and is totally inappreciable when the bar has reached a bright white heat; on cooling, it recovers its powers of action by similar steps, and the same law holds true if the magnet be heated instead of the bar. Hence, in producing the greatest development of magnetism by influence, we see the advantage of using iron or steel bars at a red heat.

Cavallo, Benett, and Coulomb remarked the indications of magnetism given by various substances, as copper, silver, &c. Coulomb formed very fine needles of various substances, and, suspending them by silk strings between the opposite poles of two powerful loadstones, found that they were acted on by the latter. This phenomenon is attributable to the existence of minute quantities of iron or iron compounds in those different bodies.

The earliest method of magnetising a bar of hard iron or steel was by drawing it throughout its whole extent at right angles over one of the poles of a strong magnet; but the magnetism thus developed is feeble, and apparent only at the extremities of the bars, or in some consecutive points formed by peculiarities in the material of the bar, or in the mode of operation. Du Hamel placed two steel bars of equal length parallel to each other, connecting their corresponding extremities by pieces of soft iron interposed; then, taking two bundles of magnetic bars, he united their poles of contrary name near the middle of one of the steel bars, and by inclining the bundles made one of them pass towards one extremity of the other bar, the second passing in the contrary direction, and then successively repeated the operation, when both the steel bars became strongly magnetised, but with contrary magnetisms at the corresponding extremities of each.

A fine steel needle may be very strongly magnetised by being placed in the axis of a wire twisted into the form of a helix, the extremities of which are brought in contact with the wires of a powerful galvanic battery. The poles of a bar magnetised to saturation are near its extremities, within generally a few lines, while the intensity becomes insensible at the distance of a few inches; in a thin bar the intensity may be represented by the difference of the ordinates of two logarithmic curves, the origin of one being at the austral, and of the others at the boreal extremity of the needle.

When bodies containing neutral magnetisms are made to rotate rapidly round an axis, the magnetism becomes developed and acts on the needle; thus a plate of copper made to revolve rapidly in a horizontal plane will influence a compass-needle placed over it, and produce in it a rotation in the same direction; on which subject several valuable observations have been made by M. Arago, Sir John Herschel, &c. It has also produced a second mathematical memoir from M. Poisson, in which the mechanical force generated by rotation is introduced into the general equations deduced

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from his theory of the distribution of magnetism in bodies.

Several Magnetic Observatories have been established in various parts of Europe, Asia, and America, from which many valuable contributions to Terrestrial Magnetism have been obtained.

For the theory of magnetism as connected with electricity consult Robison's *Course of Lectures;* Biot's *Physique;* Becquerel, *Traité de l'Electricité;* Captain Kater's and Dr. Faraday's Papers in the *Phil. Trans.* For the mathematical theory on this subject—the *Memoirs,* by Poisson; Ampère's *Electro Dynamic Treatise;* and Murphy's *Electricity,* chap. vii., Cambridge.

MAGNETISM, ANIMAL. [ANIMAL MAGNETISM.]

MAGNITUDE. This term is generally used synonymously with quantity, and is sometimes even confounded with number. The distinction between the first two terms is not more marked than this:—He who answers the question 'how much?' describes the quantity, and he who answers 'how great?' describes the magnitude. But, since magnitude is generally used in our language as applied to amount of space, we may best describe our own idiom by laying down quantity as the general term, and stating magnitude to mean usually the quantity of space. The term however must be considered, in a mathematical point of view, as originating with Euclid (whose word is *μέγεθος*); and it is used by him, not particularly as applied to space, but also to everything which admits of the introduction of the notion of greater or less. In this sense then, we have many magnitudes (all moral qualities for instance) which are not the object of mathematical reasoning. So necessary is the notion of magnitude to our conception even of things which we cannot measure, that we borrow idioms from subjects within the province of mathematics. Thus we speak of force of mind, and of it being greater in one individual than in another. According to the definition of magnitude, namely, 'that of which greater or less can be predicated, when two of the same kind are compared together,' it follows that we include both mental as well as material objects of conception. But the mathematics interpose the postulate that no such object can be made matter of exact reasoning, unless in cases which admit of the comparison being performed according to some method, the results of which shall be self-evident, and inseparable from our notion of the thing measured. Let A and B be two magnitudes of the same kind; they are then, and then only, the objects of mathematical comparison, when other magnitudes equal to A and B can be found, and added together as often as may be desired; and when, moreover, any collection of As can be compared with a collection of Bs, so as to ascertain which is greater or less than the other. Angles furnish an instance of magnitude the conception of which is exceeding vague in the mind of most beginners, but which takes precision and certainty in the course of mathematical study. Magnitudes, thus capable of comparison, are the objects of the doctrine of *Proportion.* That part of geometry which precedes proportion considers only the simple alternative of equal or unequal, modes of inequality being necessarily deferred until after that consideration.

By the magnitude of any bounded space the mathematician means the results of measurement; but the common idiom refers to that which the mathematician calls for distinction *apparent* magnitude. It is correct, in the common meaning of the term, to say, that a man at a little distance from the eye is larger than a remote mountain. In thus judging of objects, the angles which they subtend at the eye furnish the means of comparison. Experience, derived from the combination of sight and touch, teaches us how to make those deductions which are necessary before we can learn the absolute from the apparent magnitude.

It is soon found that an object as it recedes grows smaller, that is, subtends a less angle. It is also seen that the recess is accompanied by a loss of brightness and distinctness. The former is a consequence of the loss of light which takes place in its passage through the air; were it not for this, the same object would be equally bright at all distances; for, though the quantity of light which enters the eye is diminished by increase of distance, yet the surface from which the light appears to proceed is diminished in the same proportion. The loss of distinctness is a consequence, first of the loss of light, next of the different proportion in which different colours are lost; the effect of the interposed atmosphere amounting to laying on more or less of the blue colour of the atmosphere over the whole. Our perception of magnitude depends both on the subtended angle and on the distinctness; we learn from experience that, of two objects seen under the same angle, the less distinct, as being the more distant, must be the larger. That habit is our guide can readily be shown by producing instances in which we are deceived, the object being either such as is not commonly seen, or seen under unusual circumstances. A colossal statue mounted on a column does not suggest the idea of a man of unusual size to persons in general, unless when some person mounts the same height and affords means of comparison. In a fog, which diminishes the distinctness of objects, but does not affect the angles under which they are seen, these objects are sensibly increased in apparent size, and distant hills appear nearer in a clear day than in a hazy one. Those who wear spectacles may satisfy themselves by breathing on the glasses, and watching an object as the moisture evaporates, that increase of distinctness gives apparent approximation.

The angle subtended by an object is inversely as its distance, which is sufficiently near for common purposes when angles are small, which is generally the case. And a man of six feet high, at the distance of a hundred feet, is seen under an angle of 3° 26′. The sun is seen under an angle of 32′, and the moon under an angle of $29\frac{1}{2}'$ to $33\frac{1}{2}'$.

MAGNO'LIA, a genus of plants, the type of the natural order *Magnoliaceæ.* The species of Magnolia are trees or shrubs, all natives of North America and Asia. *M. grandiflora,* Great Flowered Magnolia, or Laurel Bay, is an evergreen tree, reaching sometimes a height of 70

feet. It is one of the tallest and handsomest trees of North America. It has large pale-green shining leaves nearly 10 inches long, with large white flowers. It has been cultivated in England for the last century, and in this country attains a height of from 20 to 30 feet. *M. glauca*, deciduous Swamp Magnolia, is a native of North America, in low moist swampy ground at a little distance from the sea, from Massachusetts to Florida and Louisiana. The bark has a bitter and aromatic odour resembling sassafras. On this account it has been used in America as a substitute for other aromatic bitter barks, as Cascarilla, Canella, &c., and, it is said, with great success. Although not much used in Europe, very favourable reports of its efficacy in chronic rheumatism, ague, and remittent fever have been given. The flowers are of a cream colour and have a sweet scent, which Kalm says may be smelt at a distance of three miles. The flowers are followed by red berries, which give the tree a handsome appearance. *M. umbrella* is a native of North America, in the Carolinas, Georgia, Virginia, and New York. The wood is soft and spongy, and on the mountains of Virginia is called Elmwood. *M. acuminata* is a native of North America, from Pennsylvania to the Carolinas. The fruit is about three inches long, and resembles a small cucumber, whence in America it is called Cucumber-Tree. A tincture is made of the fruit, and is used in cases of rheumatism. *M. Yulan*, or *conspicua*, grows in China, where it has been cultivated since the year 627. Its native name is Yulan. It is a very showy tree, having white flowers sometimes diffused with purple, which give out a most delicious perfume. *M. purpurea*, the Purple-Flowered Magnolia, is a native of Japan, and seldom attains a greater height than 10 feet. The bark when bruised has an aromatic odour. The flowers are more or less purple without, and always white within. It is a very ornamental species, and worthy of cultivation. The best situation for it is against a wall, when its branches will reach a height of from 15 to 20 feet.

MAGNOLIA'CEÆ, an important natural order of albuminous polypetalous Exogens, consisting of bushes and trees, inhabiting the temperate parts of both the Old and New World. In England, where they are exotics, they are among the most highly valued of ornamental plants, and every species which can bear the climate, or which will thrive in conservatories, has been collected with great care.

The genera *Talauma* and *Magnolia* have the singular property of dropping their seeds out of the back of the seed-vessels when ripe, allowing them to hang down, each suspended by a long extensible elastic cord, composed of delicate spiral vessels.

In consequence of the seeds of Magnoliaceæ containing an abundance of oil, which often becomes rancid soon after they are gathered, it is difficult to transport them to a considerable distance in a living state. The best method of succeeding in that object is to pack the seeds in earth as soon as they are ripe, pressing them close and securing them in a box. Under such circumstances they will preserve their vitality for several months.

MAGO. [CARTHAGE; COLUMELLA.]

MAGPIE. [CORVIDÆ.]

MAHÂBHÂRATAM, or BHARATAM ('belonging to Bhârata and his descendants'), the most celebrated epic poem of the Hindoos after the 'Râmâyana.' A passage in the introductory part of the work (1,2296) has given ground for the assertion that it contains the round number of a hundred thousand distichs or slocâs; but, in order to complete this enormous amount, the 'Harivansa,' a mythological history of Krishna, and sundry other pieces, have been added. The eighteen component fictions (Parva) of the 'Mahâbhârata' contain about 85,000 slocâs, and even these may be reduced to 24,000 distichs, of which the original 'Bhârata,' without its episodes, is said to have formerly consisted. (1, 101.) The principal subject of the 'Mahâbhârata,' to which its middle sections particularly are consecrated, is a long civil war between two dynasties of ancient India, the Kurus and Pândus.

In this main texture of the 'Mahâbhârata' is interwoven a great variety of episodes; or, more properly speaking, the history of the Pândus and Kurus is the leading thread by which many ancient traditions, moral reflections, poetical descriptions, and popular stories of every kind, have been connected. It is important to observe that these accessory elements, which now form almost three-fourths of the whole epopee, are stated in the poem itself not to be constituent parts of the original 'Bhârata;' in fact, they are for the most part very loosely inserted; and, as many of them are epic productions of considerable length, the principal theme is not only frequently interrupted by intervening episodes, but often totally lost sight of, even when the most active progression should be expected.

Compared with the 'Râmâyana,' the 'Mahâbhârata' is wanting in unity and internal coherence; it is rather a collection of ancient epic poems, gathered round the central history of the Kurus and Pândus; but for this reason it surpasses the former poem by a greater variety of pleasing scenes and attractive situations, particularly in its episodes, the characters of which are very often delineated with so peculiar a delicacy, and with so strongly marked an individuality, as to leave a powerful impression on the reader. Finally, the 'Mahâhbârata' may be looked upon as a most ample source of every kind of antiquarian lore, and as the only Sanskrit work, if we except the 'Annals of Kashmir,' by which a considerable quantity of the most valuable historical fragments has been preserved. The poem is evidently of later date than the 'Râmâyana;' but neither the precise time in which it was composed, nor even the epoch of its finally assuming its present shape, can yet be ascertained.

Three large quarto volumes have already appeared of a complete edition in the original Sanskrit, carefully collated by learned Pundits with the best manuscripts in the library of the Sanskrit College of Calcutta, and published by the Asiatic Society of Bengal. Various fragments and stories of the 'Mahâbhârata' have been translated into

English; and several episodes have been published separately.

MAHANUDDY. [HINDUSTAN.]

MAHE'. [HINDUSTAN.]

MAHMUD, Soboktegin of Ghisni, the founder of the Gasnevide dynasty, succeeded to the sovereignty of Khorassan and Bokhara (A.D. 997), which his father Emir Nasireddin Soboktegin had occupied under the caliphs El-Thai-Billah and Kader-Billah. He directed his arms against the Hindoos, and conquered them. Mahmud invaded Hindustan fourteen times and pillaged the country, bearing home with him enormous wealth. He died at Ghisni in 1030.

MAHMUD I., son of Mustapha II., was raised to the throne of the Ottomans after the deposition of his uncle Ahmed III. in 1730. He continued the war begun under his predecessor against Nadir Shah of Persia, but with no success, and made peace in 1736. He was more successful against Austria, from which he recovered Belgrade; and Russia, which gave up Ockzakow. In a new war with Persia, commenced in 1747, he was unfortunate; but he took little part in these transactions, which were managed by his favourites. He died in September 1754.

MAHMUD II., Sultan of Turkey, the younger son of Abdu-l-Hamid, or Ahmed IV., was born on the 14th of Ramazán, A.H. 1199 (July 20, 1785). The murder of Selim, his uncle, while attempting to regain the throne of which he had been deprived, and the deposition of Mustafa, who had occupied his place, led to the elevation of Mahmud, July 28, 1808. In spite of the threatening state of the empire, Mahmud boldly proclaimed that he would carry out the reforms of Selím. Several pashas were severely punished for disobedience; but, when the turn of the Janizaries came, they broke out into open rebellion. Mustafa was proclaimed sultan, and the rebels cried out for the head of Mahmud. Mahmud then ordered his captive brother, Mustafa, to be strangled together with his infant son; and those of Mustafa's women and concubines who were pregnant, four in number, were sewn up in leathern sacks, and drowned in the Bosporus. By these murders Mahmud became the only male descendant of Osman, which was a matter of great importance, the popular belief being that Turkey would last no longer than the family by whose great ancestor the empire was founded.

Mahmud succeeded in crushing this bloody rebellion after a struggle of two days, and, having conciliated the Janizaries, he turned his attention to his relations with the European powers. He made peace with Russia at Bucharest, May 28, 1812, on conditions more favourable to him than the unfortunate turn of the war allowed him to expect.

Mahmud availed himself of the peace to continue the work of reform. But his success against Ali Pacha, and other rebellious chiefs, was followed by fresh difficulties. No sooner was Ali's head exposed on the gate of the seraglio, than Mahmud had to prepare for a contest with Russia, and an open rebellion of the Greeks. The defeat of the Turko-Egyptian fleet at Navarino by the combined British, French, and Russian fleets, freed Greece from her invaders. None of his defeats dispirited the sultan, and he boldly proclaimed 'a holy war' against Russia. In the mean time however events had taken place which led to the destruction of his formidable enemies the Janizaries. The sultan, who had for some time resolved upon their destruction, had excited their anger by his reforms and continual adoption of European customs; and an open rebellion was the consequence. On the 15th of June, 1826, while the sultan and the grand vizír were in the country, the Janizaries marched in order of battle to the palace of the grand vizír, which they took and burnt down, and they were preparing to attack the seraglio when Mahmud returned, and, having nearly the whole population of Constantinople on his side, the Janizaries were driven for shelter within their barracks, the Et-Meídán. Their resistance however only delayed their fate for a few hours; 6000 Janizaries perished in the course of one day; several hundreds, who had not taken part in the action, but were known as rebels, were massacred in the streets or in their houses, and 15,000, who had kept quiet, were exiled to different places in Asia Minor. On the following day, June 16, a hatti sheriff pronounced the abolition of the military corporation of the Janizaries. The Russian war which followed proved unfortunate for the sultan, and the empire would have fallen a prey to the Russians, but for the interference of the great European powers, headed by England, through whose mediation the war was concluded by the peace of Adrianople, September 14, 1829. His next war was with Mehmed Ali, in which his pride was still further humbled. The ruin of the sultan seemed to be inevitable. He was saved by his greatest enemy: a Russian fleet and a Russian army stopped the progress of Ibráhim Pasha, the son of Mehmed Ali, who was advancing through Syria to Constantinople. On May 4, 1833, peace was concluded at Koniah, and Mehmed Ali obtained the object of his armament, the investiture of Syria and Adána, but he remained a tributary vassal of the Porte. So much was Turkey weakened through this war, that Mahmud, despairing of further independence, threw himself into the arms of Russia, and on July 8 signed the treaty of Unkiar Skelesi, by which Russia bound herself to assist Turkey with an army whenever she should want it, in acknowledgment of which Mahmud promised that no armed ship of foreign nations should be allowed to pass the Dardanelles without the permission of Russia. The remainder of the sultan's reign was occupied by wars against Mehmed Ali, who obtained still more advantages. The sultan died July 1, 1840, a few days before the news of the battle of Nisibis, in which Ibrahim Pasha obtained a decisive victory over the Turks. Mahmud was succeeded by his eldest son 'Abdu-l-Mejid, the present sultan.

MAHOMET. [MOHAMMED.]

MAHOMET I. was the restorer of the Ottoman empire, which he found in a state of anarchy. He extended his conquests into Europe, and obliged the princes of Bosnia, Servia, and Wal-

lachia to pay him tribute. He died, after nine years' reign, A.D. 1421.

MAHOMET II., son of Mourad II., was proclaimed emperor of the Ottomans after the voluntary abdication of his father in 1444; Mourad however was obliged to resume the reins of government till his death, in 1451, when Mahomet commenced his reign. He prosecuted many successful wars in Europe, taking Constantinople, Corinth, Negroponte, &c., by storm; he however met with some reverses at Belgrade and Rhodes. He died in Bithynia in 1481. His epitaph runs thus:—"I designed to conquer Rhodes and subdue proud Italy."

MAHOMET III. succeeded Mourad III. in 1595. He began his reign by putting to death all his brothers. He was a dissipated and effeminate man, and under him his country suffered many military losses. Revolts broke out, and the Asiatic provinces and the janizaries at Constantinople mutinied. In the midst of all these disorders Mahomet died in 1603, and was succeeded by his son Ahmed I.

MAHOMET IV., son of Ibrahim I., succeeded his father, who was strangled in a mutiny of the janizaries in 1654, when Mahomet was seven years of age. Under Mahomet IV. the two Kuprulis spread a last ray of departing glory over the decline of the Turkish state. Candia was added to the Turkish empire, and Vienna threatened. In the war against Poland which began in 1671, Mahomet was not so successful, chiefly in consequence of the abilities and bravery of Sobieski, who commanded the Polish army. In 1683 however the Turks, with a force of 300,000 men, attacked the Emperor of Germany; they swept over Hungary, and invested Vienna, where they were attacked in their intrenchments by their old opponent, John Sobieski, then king of Poland, and utterly defeated. Hungary was immediately recovered, and in consequence of these disasters the janizaries at Constantinople revolted in 1687, Mahomet IV. was deposed, and Solyman III. was raised to the throne. Mahomet died in confinement in 1691.

MAHRATTAS, or MAHARATTAS. The origin of these people, whose wars have filled so large a space in the history of British India, is involved in much obscurity. The Mahratta empire, as it takes a place in modern history, was founded in the latter half of the seventeenth century, in the reign of Aurungzebe, by Sevajee, a Hindoo in the service of the king of Bejapoor, who gave him a jaghire in the Carnatic, with the command of 10,000 cavalry. His first act was to supplant his father, Shahjee, in 1647, in the jaghire of Poonah; on which occasion he increased the number of his soldiers, and levied contributions in all the neighbouring districts. Sevajee died in 1680, and was succeeded by his son Sambajee, who was unable to withstand the power of Aurungzebe, and, falling into his hands, was put to death in 1689. On the death of Sambajee, a great number of chiefs, availing themselves of the natural facilities offered by the country, issued from various points in the mountains, and kept up a constant predatory warfare in the neighbouring provinces, plundering and devastating wherever they penetrated, till they had become, at the death of Aurungzebe in 1707, more powerful than ever. From the death of Sambajee in 1689 till the year 1818, the nominal sovereign or raja of the Mahrattas had no real power, but was a prisoner, confined in the hill-fortress of Satara, while the government was administered by the Peishwa, or minister, whose office became hereditary in the family of Balajee Biswanath, its first possessor, who fixed his residence at Poonah. He was succeeded by his son Balajee Bajerow, who died in 1761.

The next Peishwa was Madhoo Row, who filled the office for 11 years, and after his death was succeeded by his son Narrain Row. This chief was murdered in 1773. Ragoba, the uncle of Narrain Row, claimed the right of succession in opposition to Sevajee Madhoo Row, who was set up by Nana Furnavese as the posthumous son of Narrain, and who administered the government during his minority. Ragoba fled to Gujerat, where he obtained the promise of support from the Guicowar. For some time preceding these events the English government had desired the possession of Salsette and Bassein, then forming part of the possessions of the Mahratta government. They formed a treaty with Ragoba, engaging to replace him in his office, and they obtained possession of Salsette and Bassein. An English force of 25,000 men was then put in motion in his favour; but negotiations had at the same time been opened with the authorities at Poonah, and, as they confirmed to the English government the possession of Salsette and Bassein, all active assistance was withdrawn from Ragoba, who retired to Surat with only 200 attendants. Sevajee Madhoo Row died in consequence of an accidental fall in 1795, and his son Bajerow was declared Peishwa. This chief continued in power until October 1802, when, his forces being totally defeated near Poonah by Jeswunt Row Holcar, he fled to Bassein, and placed himself under the protection of the British government. In the following year he was reinstated in his capital by General Wellesley (now the Duke of Wellington). In 1815 Bajerow was detected in the endeavour to form a general confederacy against the English; his capital was in consequence surrounded, and he was forced to cede in perpetuity districts yielding a revenue of 340,000*l*. In November 1817, the Peishwa, in defiance of his engagements, suddenly attacked and destroyed the houses of the British residency near Poonah. This treacherous conduct was speedily punished, his forces, were on the following day routed by the English troops, and he became a fugitive, and wandered about in various directions until June 1818, when he surrendered himself to Sir John Malcolm, and renounced all sovereignty for himself and his family, upon the promise of an adequate pension. On this occasion the greater part of the Poonah territory, estimated at 50,000 square miles, came into possession of the English. [HOLCAR; SINDIA; POONAH.]

MAIA'NO, BENEDETTO DA, a sculptor and architect, was born at Florence, in 1444.

He first distinguished himself as a carver and inlayer of wood. His works in marble consisted of fonts, pulpits, and tombs. One of his master-pieces is the marble pulpit of Santa Croce. In architecture he did little, but he built the portico of the church of the Madonna delle Grazie near Arezzo; a chapel for himself on his own estate near Prato; and he is said to have designed the Palazzo Strozzi. He died in 1498.

Giuliano di Nardo da Maiano, the uncle of Benedetto, was likewise a distinguished artist. He succeeded Brunelleschi as the architect of the cathedral of Florence in 1446. At Naples he built the palace of Poggio Reale, and executed the sculptures of the Porta Capuana, also the triumphal arch, and the reliefs of the Castello Nuovo (now the Arsenal). At Rome he built the church and palace of San Marco for Pope Paul II. The date of his death is variously stated, but he was alive in 1471.

MAIDEN HAIR. [ADIANTUM.]

MAIDENHEAD. [BERKSHIRE.]

MAIDSTONE. [KENT.]

MA'IIDÆ, or MAIANS, a group of brachyurous crustaceans (Crabs), constituting the second tribe of the family of the *Oxyrhynchi*, according to the system of M. Milne Edwards. ('Histoire Nat. des Crustacés,' &c.) The genera are numerous.

MAIKOV, BASIL IVANOVITCH, a Russian author who gained some distinction by his talent for comic poetry, was born at Jaroslav, in 1725. He is chiefly known by his 'Yelisei, or Bacchus Enraged,' a burlesque poem, in which there is considerable humour; but the fiction is extravagant, and the narrative confused. He wrote two other burlesque poems, two tragedies, tales, and fables. He died in 1778.

MAIL (from the French *maille*), strictly 'the mesh of a net,' but applied in a collective view to defensive armour formed of iron rings or round meshes. Boyer, in his French dictionary, translates *maille* 'a little iron ring.'

MAIL, COAT OF (also denominated the Hauberk or Habergeon), armour for the body, of which there were two kinds, one called chain-mail, the other plate-mail. [ARMOUR.]

MAIM ('mayhem') is an injury done to the body of a man by forcibly depriving him of the use of some member serviceable in fight, as a means either of defence or offence, and permanently disabling him from offering such an effectual resistance to further attacks upon his person as he otherwise might have done. The destruction of a jaw-tooth, of an ear, or of the nose, or of other members, the loss of which does not interfere with the means of defence or of offence, does not amount to mayhem. But the distinction is by statutory alterations rendered of little importance.

Mayhem was formerly punished by inflicting the same privation upon the offender which he had caused to the party maimed. It was afterwards punishable by fine and imprisonment, as an aggravated trespass. But now, by 7 Wm. IV. and 1 Vict. c. 85, to stab, cut, or wound, if with intent to murder, is a capital felony, and, if with intent to maim, disfigure, or disable, is a felony punishable by transportation for life, or for not less than 15 years, or by imprisonment not exceeding three years.

Concurrently with these proceedings in the name of the crown, the party injured is entitled to compensation in the shape of damages, to be recovered in an action of trespass; and, where the damages found by the jury are not commensurate to the injury sustained, the court may increase them upon inspection of the mayhem.

MAIMBOURG, LOUIS, born in France in 1620, entered the order of Jesuits, and studied theology at Rome. On his return to France, he was employed as a preacher. Having published, in 1682, a work in which he defended the principles of the Gallican Church, 'Traité Historique de l'Eglise de Rome,' the Pope caused him to be expelled from the order of Jesuits. Louis XIV. on this occasion gave him a pension, and he retired to the abbey of St. Victor at Paris, where he died in 1686. He wrote also several other works, among which are—a 'History of the Pontificate of St. Gregory,' and histories of Calvinism, Arianism, and Lutheranism.

MAIMO'NIDES, or more properly MOSES BEN MAIMON, one of the most celebrated of the Jewish Rabbis, was born at Cordova in Spain, about A.D. 1131 or 1133.

The most valuable of the writings of Maimonides are: 'Moreh Nevochim,' or 'Teacher of the Perplexed,' originally written in Arabic, translated into Hebrew by his disciple Samuel Aben Tybbon, and into Latin by Justinian, bishop of Nebio, Paris, 1520, and by the younger Buxtorf, Basel, 1629, with a preface, which contains an account of the life of Maimonides; and 'Yad Hazakah,' or 'The Strong Hand,' which contains a complete digest of the Hebrew laws. It is written in remarkably good Hebrew. The best edition is that printed at Amsterdam, 1702, 4 vols. fol.

Maimonides founded a college at Alexandria for the instruction of his countrymen, in which he delivered lectures on philosophy and the Jewish laws. He died in Egypt at the age of 70.

MAIN. [BAVARIA.]

MAINA, the modern name of a district of the Peloponnesus, which occupies the south-west part of the ancient Laconica, extending along the range of the Taÿgetus to Cape Matapan. The inhabitants of this mountainous district were never subjugated by the Turks, but lived in a kind of savage independence, often making incursions into and plundering the neighbouring districts occupied by the Turks, and some of them were pirates. The number of the Mainiotes has been variously stated, by some as high as 40,000. They are now subjects of the kingdom of Greece.

MAINE, LE, one of the old provinces of France, was bounded N. by Normandie, E. by Orléanais, S. by Anjou or Touraine, and W. by Bretagne. It now forms the department of SARTHE (with the exception of the arrondissement of La Flèche), the arrondissements of Laval and Mayenne in the department of MAYENNE, the arrondissement of Mortagne in the department of ORNE and part of the arrondissements of Dreux and Nogent-Le-Rotrou in the department of EURE-ET

Loir. It was formerly divided into Haut-Maine, capital Le-Mans; Bas-Maine, capital Mayenne; Haut-Perche, capital Mortagne; Perche-Gouet, chief town Montmirail; Terres-Françaises, chief town Tour-Grise; and Thymerais, chief town Châteauneuf. (*Dictionnaire de la France.*)

MAINE is the most northern of the United States of North America. It is bounded S.W. and W. by New Hampshire, S. by the Atlantic Ocean, E. by New Brunswick, and N. and N.W. by Canada. The southern boundary of Canada, which had long been in dispute between the United States and Great Britain, was definitively settled in 1846, and is described in the article British America. Maine extends from 43° 5′ to 47° 20′ N. lat., and 66° 50′ to 70° 55′ W. long. The area is estimated at about 30,000 square miles. The population in 1840 was 501,793, of whom none were slaves.

Surface and Soil.—The coast-line of Maine is indented by numerous bays, of which the principal are—Casco Bay, Penobscot Bay, Frenchman's Bay, Machias Bay, and Passamaquoddy Bay. These bays contain a great number of small islands, and some of considerable size, such as Mount Desert, in Frenchman's Bay, and Long Island, Fox Island, and Deer Island, in Penobscot Bay. Though the frost along this shore is very intense in winter, and the numerous islands favour the formation of ice, the harbours are commonly open all the year round, the strength of the tide, which rises from between 24 to 40 feet, preventing their being closed up. The country rises gradually, but rather rapidly from the shore. The surface of the state is mostly hilly; but it is only in the north-western and northern districts that the hills rise to the height of mountains, of which the highest, Mount Kathadino, rises to more than 5330 feet. This mountainous district occupies more than one-fifth of the area of the state.

The remainder of the state is occupied by a hilly region, which is well drained by numerous rivers with a rapid course. Along the sea-coast, and from ten to twenty miles inland, the soil is of moderate fertility, and frequently intersected with sandy and sterile tracts; but beyond this region the soil improves, and produces plentiful crops of grain, flax, and hemp.

Rivers.—The rivers in the southern district have a short course. The principal are the Piscataqua, the Saco, and the Presumscot, or Casco. East of Casco Bay is a deep indentation which receives two considerable rivers, the Androscoggin and the Kennebec. The Androscoggin rises about 45° 12′ N. lat., 71° 15′ W. long., and flowing S. and W., and again S. and W., after a course of about 200 miles joins the Kennebec near its mouth in Kennebec Bay. The Kennebec rises in several branches on the eastern declivity of the mountain-range which separates Maine from Canada: these branches unite in Moose-Head Lake, a sheet of water about 30 miles long from north to south, with a breadth varying from 5 to 20 miles. From this lake the Kennebec issues in a large stream, and the general direction of the remainder of its course is to the S., till it reaches the mouth of the Androscoggin, after a course of about 250 miles. Though its course is obstructed by falls and shoals, like that of the Androscoggin, it is of great importance in the transportation of lumber. The tide ascends to Augusta, 70 miles from the open sea. The Penobscot falls into Penobscot Bay, has a course of about 250 miles, and is navigable for large ships to Bangor, 52 miles from the sea. The St. Croix, or Scodie, which separates Maine from New Brunswick, enters Passamaquoddy Bay after a course of about 100 miles. Lakes and ponds in the interior are very numerous.

Climate.—The winter is very severe. From the 1st of November to the 1st of April the ground is covered with snow, and the rivers and lakes with ice. The summer on the sea-shore is very hot; the thermometer frequently rises to 90°, and even 96°, and the weather is subject to sudden and great changes. Drought is frequent.

Productions and Trade.—A very dense forest covered Maine in its natural state, and still spreads over the greatest part of it, the settlements being yet restricted to a comparatively narrow zone along the sea-coast. These forests, consisting principally of white pine, spruce, maple, beech, birch, white and gray oak, constitute the principal wealth of the state, timber being its staple. The cultivated fields do not occupy one-twentieth part of the surface. Indian corn constitutes the principal food of the inhabitants, but wheat, rye, barley, oats, peas, hemp, and flax are also grown. The fruit trees of northern Europe thrive very well, especially pears and apples. Cattle and hogs are numerous, and afford articles of exportation. Maine, so far as it has yet been explored, is not rich in minerals, but iron-ore occurs in several places. The trade and navigation of Maine are chiefly in timber, fish, and a few other articles, which are exported to the southern United States, and to the British colonies. The quantity of timber floated down the rivers is very large. There is little intercourse between the ports of Maine and the countries of Europe.

Communications.—The Cumberland and Oxford Canal, 20½ miles long, connects Portland with Sebago Pond; it has 25 locks, and by another lock in the river Saco it is extended through Brandy Pond and Long Pond, making the whole length 50 miles. Bangor is connected with Orono by a railroad 12 miles long, and a railroad has been projected from Bangor to Portland 132 miles. The Portland, Saco, and Portsmouth Railroad is connected with a railroad from Boston to Portsmouth in New Hampshire.

Towns.—Maine is divided into 13 counties. The following are the principal towns, with the population of each in 1840:—*Augusta*, situated on both sides of the Kennebec, 43 miles from the sea, at the head of the sloop navigation, is the capital of the State. The two parts of the town are connected by a bridge 520 feet long. The state-house is of white granite, and there are several other handsome buildings. Population, 5314. *Bangor* is situated on the west side of the river Penobscot, 60 miles from the sea, at the head of the navigation. The Kenduskeag, a stream 19(

yards wide at its mouth, divides the city into two parts, which are connected by bridges. This stream, about a mile above Bangor, has falls which give water-power for driving mills. The harbour is spacious, and the tide rises 17 feet in it. Vast quantities of lumber are brought down the river, and besides this a large number of vessels are employed in the coasting trade. Steam-boats ply regularly to and from Portland and Boston. Population, 8627. *Bath*, on the west bank of the Kennebec, 12 miles from the sea, is one of the chief commercial towns of Maine. Ship-building is largely carried on, and there is an active coasting trade by sailing vessels and steamers. Population, 5141. *Belfast*, a port of entry, at the head of Belfast Bay, on the west side of the river Penobscot, 30 miles from the sea, has a spacious and safe harbour, and a large coasting trade. Population, 4186. *Bristol*, a sea-port at the head of Bristol Bay, in the north-west angle of Penobscot Bay, in the place where the first settlement of Maine was commenced, in 1625. Population, 2945. *Brunswick*, on the south side of the Androscoggin, contains Bowdoin College, which had, in 1848, eight instructors, 971 alumni, 126 students, and a library containing 25,450 volumes. Much lumber is brought down the Androscoggin, and there is great water-power here, by which 13 saw-mills are driven. Population, 4259. *Calais*, on the river St. Croix, nearly opposite to St. Andrews, in New Brunswick, has also great water-power. Population, 2934. *Eastport*, is situated on Moose Island, in Passamaquoddy Bay, and has a capacious dock. Population, 2876. *Freeport*, at the head of Casco Bay, has a small harbour. Population, 2662. *Gardiner*, is situated on the west side of the Kennebec. The river Cobbeseconte here enters the Kennebec, with a succession of falls which afford great water-power. Population, 5042. *Hallowell*, on the west side of the Kennebec, has an extensive coasting trade by small vessels and steam-boats. Population, 4684. *Portland*, a city and seaport at the western extremity of Casco Bay, is a large town, with several handsome public buildings, especially the city-hall and court-house. It contains 16 places of public worship. The harbour is spacious and safe. Besides a good coasting trade, chiefly to Boston, with which it is also connected by a railroad, it has a considerable trade to the West Indies and Europe. Population, 15,218. *Prospect* is situated on the west side of the river Penobscot, at its entrance into Penobscot Bay. Population, 3492. *Saco* is situated on the east side of the river Saco, 6 miles from the mouth, where there is a descent of 42 feet, which affords great water-power. It has numerous mills, and a fine basin below the falls, where vessels take in their cargoes. Population, 4408. *Thomaston*, between Penobscot Bay on the east, and the St. George's River on the west, 12 miles from the sea, has a large trade in lime. The Maine state-prison is situated here, and the prisoners are employed in quarrying and cutting granite for exportation. Population, 6227. *Vassalborough*, on the east bank of the Kennebec, 11 miles N. by E. from Augusta, has great water-power by means of the outlets of two lakes. Population, 2952. *Waterville*, on the west bank of the Kennebec, is situated at Teconic Falls; and Emerson's Stream, which falls into the Kennebec, has also a high fall, which affords good water-power. Population, 2971. *Wiscasset*, at the mouth of the river Sheepscot, has a fine harbour, which admits vessels of the largest size, has a good trade, and does a good deal of ship-building. Population, 2314. *York*, on the north side of York River, one mile from the sea, has a harbour which admits vessels of 250 tons' burthen. Population, 3111.

Constitution and History.—The governor of the State of Maine is elected for one year. The legislature consists of 31 senators, who are elected for one year, and 151 representatives, who are elected for one year. It sends 2 senators and 7 representatives to Congress.

Maine seems to have been discovered by one of the Cabots in 1497. It was afterwards visited by the French, who called the southern part, west of the Kennebec, Maine, and the eastern part Acadie. The English made some settlements in the southern district about 1635. The first charter was proprietary, and granted in 1639 to Sir Ferdinand Gorges; but in 1652 Maine was united to Massachusetts, under the title of the county of Yorkshire. In 1676 Massachusetts bought the country from the family of the Gorges, and from that time it remained annexed to that state; but a part of the country belonged to the French, till it was ceded to the English by the peace of Utrecht. Massachusetts, in 1819, gave permission to the freemen of Maine to decide the question of a separation, when, the majority of votes being in favour of it, Maine became an independent state in 1820.

MAINE-ET-LOIRE, a department in France, formed out of the old province of Anjou, and named from its two principal rivers, the Maine and the Loire, is bounded N. by the departments of Mayenne and Sarthe, E. by Indre-et-Loire, S. by the departments of Vienne, Deux-Sèvres, and Vendée, and W. by Loire-Inférieure. Its greatest length is 77 miles, its greatest breadth 60 miles. The area is 2788 square miles, and the population in 1846 was 504,963, which gives 181.12 to the square mile, or 7.37 above the average per square mile for all France.

The department presents a pleasing variety of low hills, mostly planted with vines, and of plains, which are very fertile. The fields are inclosed by ditches and quickset hedges, within which clumps of trees are planted here and there, the whole giving a warm and agreeable aspect to the country.

The department belongs entirely to the basin of the Loire, which river crosses it from E. to W., and forms in its course several beautiful islands. The northern districts are drained by the Mayenne and its feeder the Oudon, by the Sarthe and its feeder the Loir, and by the Authion. [MAYENNE; SARTHE; LOIRE-ET-CHER; INDRE-ET-LOIRE.] The Mayenne and the Sarthe unite above Angers, and form the *Maine*, which after a course of about five miles falls into the Loire S. by W. of Angers. These last-named rivers are navigable; the Loire steamers between Nantes and

Tours ply up the Maine as far as Angers. The chief feeders of the Loire from the left bank in this department are the Thouet and the Layon. The Sèvre-Nantaise, and its tributary the Moine, drain a small portion of the south-west of the department. The department is traversed by the Orléans-Nantes Railroad, which is now (June, 1849) open to Saumur; it is also crossed by 9 royal, 24 departmental, 17 military, and 33 parish roads. The climate is healthy, and the temperature mild; winter is rainy; west and south-west winds prevail.

The soil is generally fertile, yielding corn more than enough for the consumption. The chief crops are wheat, rye, barley, and pulse of all kinds. Other valuable products are hemp, flax, nuts, excellent fruits, &c. About 11,000,000 gallons of white and red wine are made annually, some of which is of good quality. Since 1838 a good deal of effervescing wine, resembling the true champagne and rivalling it in quality, has been manufactured. The department is famous for its melons. A considerable quantity of cider is also made. The forests of the department, which are extensive, consist chiefly of oak and beech. The pasturage is good, and great numbers of horses, mules, horned cattle, and sheep are reared. Deer and wild boars are met with in the forests; wolves and badgers are sometimes seen; foxes, weasels, and wild cats are more common. Feathered game is very abundant. Fish is plentiful; the rivers are infested by otters. Among the reptiles are vipers, adders, the common snake, and land-lizards.

Iron and coal-mines are worked. Marble, granite, building and lime-stone, slate, and potters' clay are quarried. The slate quarries of the department, especially those of Angers, are vast and frightful excavations, worked right from the surface of the ground. They give employment to above 3000 men, who raise about 80,000,000 slates annually. The number of wind and water-mills amounts to 622; of iron forges and foundries to 90; and there are 160 factories and workshops of different kinds, in which sailcloth, linen, cotton handkerchiefs, flannels, paper, oil, cotton and woollen yarn, &c. are made. There are also numerous tanyards, sugar-refineries, distilleries, bleach-mills, and dye-houses. About 340 fairs are held in the year.

The department is divided into 5 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Angers . . .	9	59	152,406
Baugé . . .	6	67	80,341
Segré . . .	5	62	60,210
Beaupréau . .	7	73	117,078
Saumur . . .	7	93	94,928
Total . .	34	354	504,963

In the arrondissement of Angers the chief town is Angers, which is also the capital of the whole department. *Chalonnes*, prettily situated at the foot of a hill between the Layon and the Loire, 14 miles S. by W. from Angers, has 4927 inhabitants, who manufacture serge, handkerchiefs, and brandy. *St.-Georges*, W. of Angers, and near the right bank of the Loire, has a population of 2712. *Ponts-de-Cé*, a town of 4000 inhabitants, stands about 4 miles S. from Angers, at the entrance of the Authion into the Loire. It takes its name from the series of bridges that here connect the banks of the Loire with the intervening islands. These bridges form one of the most important passes of the Loire; they are partly of wood and partly of stone, and contain 109 arches in all, the entire length, including the causeway, being 3280 yards. The town consists merely of rows of houses built along the causeways connecting the bridges. About half a mile below Ponts-de-Cé, and on the right bank of the Loire, is an ancient Roman encampment.

The arrondissement of Baugé is named from its chief town *Baugé*, which stands E. of Angers, near the Couesnon, a feeder of the Authion, and has a tribunal of first instance, a college, and 3278 inhabitants, who manufacture coarse woollens, linen, and articles of horn. The old castle built here by Foulques Nera is well preserved, and forms now one of the finest hospitals in Maine. *Beaufort*, situated in an extremely fertile country on the right bank of the Loire, was formerly one of the most important towns of Anjou; but since the construction of the dyke along the Loire, on the summit of which the road from Tours to Angers runs, and not as formerly through Beaufort, the town is much fallen from its former prosperity It is however a well-built and still important town, with 5474 inhabitants, who manufacture sailcloth, zinc, leather, &c. There is also a considerable trade in corn, wine, oil, fruit, hemp, &c. *Durtal*, a town of 3452 inhabitants, is built at the foot and on the slope of a hill on the right bank of the Loire, which is here passed by a bridge of cut stone. There is a pretty château, with two battlemented and machicolated towers, on a hill near the town. Earthenware, tiles, bricks, and linen are manufactured here. *Longué*, on the Lathon, a feeder of the Authion, a few miles S. of Baugé, has 4287 inhabitants, who manufacture oil and leather, and trade in cattle, leeches, and agricultural produce.

The arrondissement of Segré is named from its chief town *Segré*, which is situated in the north of the department, on the Odon, a feeder of the Mayenne, and has a tribunal of first instance, and 2211 inhabitants. *Lion-d'Angers*, a well-built little town, near the junction of the Odon with the Mayenne, has a population of 2732. *Pouancé*, in the north-western angle of the department, has iron-smelting forges and blast furnaces, and 2821 inhabitants.

In the arrondissement of Beaupréau the chief town, *Beaupréau*, stands on the Erve, a feeder of the Loire, 34 miles S.W. from Angers, and has a tribunal of first instance, a college, and 3887 inhabitants. There is a fine turreted château near the town. Leather, flannel and other woollen stuffs, and linen are manufactured. *Chemillé*, E. of Beaupréau, on a river called Ionne, is an

old town with 4049 inhabitants, who manufacture linen of all kinds, calico, cotton yarn, and paper. *Cholet*, or *Chollet*, a busy manufacturing town in the south of the department, stands on the Moine, and has a tribunal of commerce, a council of Prud'Hommes, a college, and 8413 inhabitants. The town was burnt in the Vendean war by the Vendeans and the Republicans; but it has been since rebuilt. It is famous for the manufacture of linen and pocket-handkerchiefs; flannel, calico, cotton yarn, and leather are also made; there is a brisk trade in these articles, and in cattle and agricultural produce. *St.-Florent-le-Vieil*, a town of 2025 inhabitants, stands on a steep hill above the left bank of the Loire.

In the arrondissement of Saumur the chief town, Saumur, stands in a charming situation on the left bank of the Loire, at a distance of 40 miles by railroad W. from Tours, and has tribunals of first instance, and of commerce, a college, and 12,258 inhabitants. A magnificent stone bridge, of 12 arches, 310½ yards long, joins the town to an extensive suburb built on several islets in the river and along the dyke on its right bank. Saumur is built at the foot and on the slope of a hill, the summit of which is crowned by an old castle, now used as an arsenal. The lower part of the town is well built, and extends along the river, which is lined with quays. The higher part of the town is irregularly built; the streets are ill laid out, and some of them very steep. The principal buildings, besides the castle, are the churches of St.-Pierre, Nantilly, and Notre-Dame-des-Ardilliers (the convent formerly attached to this church is now an hospital); and the town-hall. The splendid barracks of Saumur, which were built between the Loire and the Thouet, were destroyed by fire, May 8, 1848. Other objects of notice at Saumur are the public library, the theatre, and the baths. There are several fine promenades; the view from the castle over the valley of the Loire is very splendid. The environs of Saumur, along the left bank of the Loire, abound in druidical monuments. The chief industrial articles are linen, handkerchiefs, enamelled articles, beads, saltpetre, and leather. The line of steamers that ply between Nantes and Tours put in at Saumur. *Doué*, S.W. of Saumur, is a well-built little town, with 2590 inhabitants, who trade in corn, linen, iron, and cattle. It possesses one of the finest fountains in France, both in an architectural point of view and on account of the abundance of its waters. *Fontevrault*, in the south-eastern angle of the department, 9 miles from Saumur, has a population of 3639. The town owes its existence to the famous abbey of Fontevrault, founded in 1099, of which the great church, a magnificent monument of the 12th century, and all the other buildings now remaining, have been converted into a central prison for 11 departments. The abbey possesses great interest for an Englishman; it contains the cemetery of the Norman Kings of England and the Counts of Anjou. The tombs of Henry II. and his queen, Eleanor of Guienne, of Cœur-de-Lion, and Elizabeth, the Queen of John, alone have been saved from utter destruction.

The department forms the see of the Bishop of Angers, is included in the jurisdiction of the High Court (Cour Royale) and University Academy of Angers, and belongs to the 12th Military Division, of which Nantes is head-quarters. Under the monarchy it returned 7 members to the Chamber of Deputies; it now has 11 Representatives in the Legislative Assembly of the Republic*.

(*Dictionnaire de la France; Annuaire pour l'An* 1849.)

MAINIOTES. [MAINA.]

MAINTENANCE is defined to be when a man maintains a suit or quarrel to the disturbance or hindrance of right. If he who maintains another is to have by agreement part of the land or debt, &c., in suit, it is called Champerty. Maintenance was an offence at common law, and has also been the subject of several statutes, one of which is the 32 Hen. VIII. c. 9.

MAINTENANCE, SEPARATE. [ALIMONY; DIVORCE.]

MAINTENON. [EURE-ET-LOIR.]

MAINTENO'N, FRANÇOISE D'AUBIGNE', MARQUISE DE, was born at Niort, in 1635. She was first married to Scarron, the comic poet. When Scarron died, in 1660, his widow was left poor; but some of her friends recommended her to Madame de Montespan, the mistress of Louis XIV., as governess to her children by the king. She thus became known to Louis, who gradually conceived great esteem for her. The king made her a present of 100,000 livres, with which she purchased the estate of Maintenon, when the king conferred on her the title of Marchioness of Maintenon. Having consulted his confessor, Père La Chaise, the latter advised a private marriage; and in 1685, Louis, who was then forty-seven years of age, was secretly married to Madame de Maintenon, who was fifty years old, by the Archbishop of Paris, in presence of the Père La Chaise and two more witnesses. The marriage was always kept secret, and Madame de Maintenon herself never avowed it. She always exercised great influence over the king in all matters. After the death of the king she retired to Saint Cyr, where she died in 1719.

MAINZ, *Mentz*, or *Mayence*, the Roman *Moguntiacum*, the capital of the province of Rheinhessen in the grand-duchy of Hesse-Darmstadt, is situated on the left bank of the Rhine, a little below the junction of the Main with that river, on the slope of a hill, in 50° N. lat., 8° 11′ E. long., and has 31,000 inhabitants. It is connected, by a bridge of boats over the Rhine, with the village of Kastel, or Kassel, included in its system of fortifications, which render Mainz one of the strongest fortresses in Europe, and a chief bulwark of Germany against France. On the land side there are four gates with double drawbridges, and towards the river several gates

* In the notices of the French departments that remain to be given the number of Representatives returned by each to the Legislative Assembly is stated. The Assembly consists of 750 members; of which France, including Corsica, returns 739, or one representative for every 48,000 of the population; Algérie and the other French dependencies return the other 11.

Mainz, as a fortress, belongs to the German Confederation, and is garrisoned by Austrian, Prussian, and Hessian troops. The military governor, who retains his post five years, is alternately an Austrian and a Prussian general. The town is ill-built. The streets are narrow, crooked, and gloomy, though there are many handsome edifices. Of the squares, the principal is the Parade, which is surrounded with avenues of trees. Of the 11 churches, of which one is for Protestants, the most remarkable are the cathedral, a vast building, surmounted by a lofty cupola; the church of St.-Ignatius, which is considered a model of beautiful ecclesiastical architecture; St. Peter's; and St. Stephen's. The other chief buildings are the grand-ducal palace, the arsenal, the palaces of the commandant and of the vice-governor, the episcopal palace, the new theatre, &c. A bronze statue of Gutenberg, the inventor of printing, and a native of Mainz, modelled by Thorwaldsen, and cast in Paris, was erected in an open space opposite the theatre, in 1837. The expenses were paid by subscriptions from all parts of Europe. A gymnasium has taken the place of the former university, and there are several schools. The city library consists of above 90,000 volumes, and in the same building there are extensive collections of Roman antiquities, medals, &c. The Eichelstein in the citadel is supposed to be a monument in honour of Drusus Germanicus, brother of the Emperor Tiberius. The environs are very beautiful, and the prospects over the surrounding country magnificent. Mainz is a free port; it has few manufactures, but the commerce is considerable. Steamers ply regularly to the chief towns on the Rhine. Two railroads run from Kassel, one E. to Frankfurt-am-Main, the other N. to Wiesbaden.

MAIRE, LE, STRAIT OF, lies in the Southern Atlantic Ocean, on the eastern shores of Tierra del Fuego, between Staaten Island, and King Charles Southland, along which they extend between Cape San Diego and Cape Good Success. This strait, which is situated in the route of vessels making for Cape Horn, is about 20 miles in length and width. It is free from rocks and shoals; but still some difficulties are encountered in traversing it from the north, on account of the prevalence of western and south-western winds, and a strong current, which always sets through it from the south. It was first traversed by the Dutchmen Le Maire and Schooten in 1616, from the former of whom it received its name.

MAIRE, JACQUES LE, was born about 1590. He is remembered as the discoverer of the Straits of Le Maire, and the first navigator who doubled Cape Horn: he was incited to the enterprise by the right of the Dutch East India Company to prohibit any vessel not belonging to them to double the Cape of Good Hope. He died in December 1616, on his voyage home from Batavia.

MAITLAND, SIR RICHARD, of Lethington, was born in 1496. He studied law in France, and on his return to Scotland followed that profession. In 1550 his book of 'Reports of the Decisions of the Court of Session' commences; and about the same time he appears in the sederunts of the court as an extraordinary lord of session. Sir Richard became blind about the year 1559, about the end of which he concludes his 'History and Chronicle of the House and Surname of Seaton.' In 1562 he was made lord privy-seal; but this office he in a few years afterwards resigned in favour of his second son John. He died March 20, 1586. His valuable collection of Scottish poetry is now preserved in the Pepysian Library, Magdalen College, Cambridge. His poetical writings were printed, in 1830, by the Maitland Club.

MAITTAIRE, MICHAEL, was born in France, 1688, of Protestant parents, who settled in England at the revocation of the Edict of Nantes. Maittaire was educated at Westminster School under Dr. Busby, whence he went to Oxford. From 1695 to 1699 he was second master in Westminster School. In 1699 he resigned that appointment, and devoted the remainder of his life to literary pursuits. He died August 4, 1747, at the age of 79.

Maittaire was a learned and laborious scholar. He edited many of the classical authors, with useful indexes, and also wrote several works, of which the most important are—'De Græcæ Linguæ Dialectis,' Lond., 1706, 1742, the best edition of which is by Sturz, Leip., 1807; 'Stephanorum Historia, Vitas ipsorum ac Libros complectens,' Lond., 1709; 'Historia Typographorum aliquot Parisiensium, Vitas et Libros complectens,' Lond., 1717; 'Annales Typographici ab Artis Inventæ Origine ad Annum 1557 (cum Appendice ad Annum 1664),' Amst. and Lond., 1719-1741.

MAIXENT, ST. [SE'VRES, DEUX.]

MAIZE, or *Indian Corn*, is a plant commonly cultivated in the warmer parts of the world, where it answers a purpose similar to that of wheat in more northern countries. It is the *Zea Mays* of botanists, a monœcious grass, of vigorous growth, with stems not more than two feet high in some varieties, and reaching the height of eight or even ten feet in others. Each grain has a long thread-like style, which projects beyond the enveloping sheaths; and, as there are some hundreds of them upon each spike, the whole form a long tassel, which looks as if made of silk. A plant generally bears two full ears, the grains of which vary greatly in number: some of the largest ears in America contain at least 800 grains.

This plant in its wild state is met with in Paraguay, in Chili, and in North America. The bread made from maize is not so palatable to some as wheat bread; but, by mixing it in certain proportions with wheat, it makes a very pleasant food. In the United States of North America, Indian corn forms almost the only bread eaten by many of the people; and in the slave-states it is the only bread that the negroes eat. It is not, however, in the shape of baked bread that maize is most generally used in Europe, but in boiled messes and soups, as peas are with us.

A light, moist, and warm soil suits this plant best. It thrives well on land broken up from grass. The time for sowing maize in the south of France is the month of April; farther north, it

is sown later. The distance between the rows of maize varies from two to four feet. The seed is sometimes sown in the furrow after the plough, and sometimes put in with the dibble. Two or three inches deep is sufficient to make the seed germinate readily. In warm moist climates the plant is very soon above ground. When the plants are three or four inches out of ground, and no frost is feared, they are thinned out to two feet apart, and in very rich soil three feet is better. Maize, however sown, must be repeatedly hoed. At the first hoeing the plants which are too close are pulled up. When the plants are a foot high, there is a second hoeing; and, when the flowers are ready to expand, a third hoeing is given, to kill weeds and open the surface of the soil slightly. The young ear is preserved as a pickle, like young cucumbers: when a little advanced, it is roasted on the coals, or before the fire, and is pleasant to eat: in the green state, when the grains are still soft and milky, it is boiled and used as a vegetable, and is considered a delicacy.

When the maize is fully ripe, the ears are twisted off by hand and laid in a dry place; they are turned occasionally, that the sheath may not become musty, and are then stored in a dry place. The leaves are gathered for fodder a short time before the ears are pulled. In America and in Italy mattresses are stuffed with the dry sheath, which makes a cool and elastic bed.

Horses, pigs, and poultry are fond of maize; it gives the flesh of the last two a peculiarly fine flavour. One of the most important uses of maize in Europe is to sow it thick, to be cut green as food for cows, oxen, and sheep. In a proper climate there is no plant which gives so great a mass of green food as maize. The produce is most abundant and nutritive.

MAJOR, in Music, a term applicable to the imperfect concords, but chiefly to the interval of the 3rd. It is also used to distinguish the mode which takes a major or sharp 3rd, from that having a minor or flat one. The *major* mode has always a greater 3rd—*i.e.* a 3rd consisting of two tones; and the *minor* mode has always a minor 3rd—*i.e.* a 3rd consisting of a tone and a semitone.

MAJOR, a field-officer next in rank below a lieutenant-colonel, and immediately superior to the captains of troops in a regiment of cavalry, or to the captains of companies in a battalion of infantry. His duty is to superintend the exercises of the regiment or battalion, and, on parade or in action, to carry into effect the orders of the colonel. The major has also to regulate the distribution of the officers and men for the performance of any particular service.

A brigade-major is a staff-officer who performs for a brigade, or in a garrison, duties corresponding to those of a major in a regiment or battalion.

A serjeant-major of a regiment is a non-commissioned officer, who in general superintends the military exercises of the soldiers: on parade, he has the care of dressing the line.

MAJOR-GENERAL. [GENERAL.]

MAJOR, or MAIR, JOHN, was born at the village of Cleghorn, near North Berwick, in East Lothian, about the year 1470. He appears to have studied for a short time both at Oxford and Cambridge, but he afterwards went to the University of Paris in 1493. He was made a doctor of the Sorbonne in 1505, and taught in the college of Montaigu; eventually he became provost or principal of St. Salvator's College at St. Andrews, and appears to have died in that office about the year 1550.

Major's works are all in Latin, and the principal are Commentaries on the Four Books of Sentences, some theological expositions and commentaries on parts of the Scripture, and his History of Scotland, entitled 'De Historia Gentis Scotorum, seu Historia Majoris Brittanniæ,' first printed in 4to. at Paris, in 1521. The style of all his writings is careless and inelegant.

MAJORCA. [BALEARIC ISLANDS; SPAIN.]

MAKRIZI, a celebrated Arabic writer, was born at Cairo, between A.D. 1358 and 1368. It appears that he resided at Cairo, during the greater part, if not the whole of his life, that he discharged at different times the duties of several public offices, and that he died, at an advanced age, in A.D. 1442.

Makrizi wrote several historical works, of which copious extracts are given in De Sacy's Arabic Chrestomathy. The most important of these works is his 'Description of Egypt,' which gives an account of the history of the country from its conquest by the Mohammedans, as well as a description of its natural history and antiquities, and of the manners and customs of the inhabitants.

MALABAR. [HINDUSTAN, vii. 196.]

MALACCA, a town in Southern Asia, situated on the western coast of the Malay Peninsula, in 2° 14′ N. lat. and 102° 12′ E. long., on the Straits of Malacca. It stands on the northern banks of a small river. South of the town there is a small island, between which and the continent is a harbour. Many of the houses are tolerably well built; but the greatest part, which are inhabited by Asiatics, are composed of bamboo and mat huts. On the southern side of the river are the ruins of a fort, now converted into a public promenade. Malacca was first visited by the Portuguese in 1507, and was taken by Alfonso Albuquerque in 1511. It continued in a flourishing condition till 1640, when it was taken from the Portuguese by the Dutch. The British obtained possession of it in 1795, the Dutch in 1801, the British again soon afterwards, the Dutch again in 1814, and the British finally in 1824.

Besides the town, this colony consists of a tract of country about 40 miles long and 30 miles wide. The country along the sea-coast, to the distance of 12 or 15 miles, is low and nearly level; in many parts swampy, and mostly covered with wood. Coffee, pepper, and fruits are cultivated. Tin and lead are found.

The bulk of the population consists of Malays. There are some Hindoos and Chinese, and also some descendants of the Portuguese and Dutch. The population is about 30,000.

MALACCA, THE STRAITS OF, separate the Malay Peninsula from the island of Sumatra. They begin on the north between Diamond Point

on Sumatra, and the island of Pulo Penang, near the shores of the continent, about 5° 20′ N. lat., and terminate on the south between the most southern cape of the Asiatic continent, the Tanjong Burus (1° 15′ N. lat.), and the islands of Carimon or Krimun (1° N. lat.). Its direction is from north-west to south-east, between 97° 30′ and 103° 40′ E. long. At its northern extremity it is nearly 180 miles wide, but it diminishes to 30 miles near the southern end. Perhaps in no part of the globe is the temperature of the air less subject to changes than on these shores.

MA'LACHI, the last of the twelve minor prophets. Nothing is known of his life; and indeed, as the name occurs nowhere else as a proper name, and signifies 'messenger,' many conjectures have been ventured as to the real person, some identifying him with Ezra, and some supposing that he was an incarnate angel. It is probable, as the editor of the 'Pictorial Bible' thinks, 'that the prophecy is anonymous, and that the title Malachi is given to the prophet from the distinct prediction concerning "my messenger" (iii. 1), which has always been considered by both Jews and Christians as one of the most remarkable and important prophecies in Scripture.' The authenticity and the canonical authority have never been questioned.

MALACO'LOGY. The science of *Molluscous* or *Soft-Bodied Animals* (Μαλακὸς, soft, and λόγος, a discourse) includes the knowledge of such animals, whether protected by shells or entirely naked, and their distribution into classes, sub-classes, families, genera, and species. In this more extended and philosophical view of the subject *Conchology* may now be considered as merged; and the more modern classifications are based upon the anatomy of the soft parts and the habits of the animals, as well as upon the structure of the shells in those molluscous forms which have that protection.

The shell-collector of former days looked upon his drawers, if they were rich in rare species or varieties, as containing an assemblage of gems; and indeed the enormous prices given for fine and scarce shells, joined with the surpassing beauty of the objects themselves, almost justified the view which the possessor took of his cabinet of treasures. They were to him objects of the greatest delight; and the energetic zeal with which he collected, and the sacrifices that he made to procure a fine and perfect *Many-Ribbed Harp*, a *Gloria Maris*, or *Cedo Nulli*, among the cones, an *Aurora* or *Orange-Cowry*, a *Voluta aulica* or *Voluta Junonia*, &c., were only comparable to the extravagancies of those visited by the tulip mania when it was at its height. But, though they were the delight of his eyes, they were, in nine cases out of ten, little more to the owner of them: they were mere trinkets on which he looked doatingly without knowing, and scarcely wishing to know, the organisation of the animal whose *skeleton* only was before him. This innocent trifling came at last to be viewed in its true light by some collectors worthy of better employment, who put off childish things and went deeper into the subject. Lister, Adanson, Linnæus, Poli, Cuvier, Lamarck, De Blainville, and others, gave dignity to this department of zoology, and gradually raised the science to its proper rank; whilst the comparatively imperishable nature of the covering of the testaceous mollusks became, in the hands of such men as William Smith and his followers, among the most valuable records by which the stratification of the earth's crust could be demonstrated, and its geological history deciphered.

M. de Blainville's term, *Malacozoa*, or *Malacozoaria*, is not generally adopted in this country.

[Animal; Conchacea; Conchifera; Conchology; Cephalopoda; Gasteropoda.]

(See *Mollusca*, in Cuvier's *Règne Animal*, and M. de Blainville's *Manuel de Malacologie*, 1825.)

MALACOPTERY'GII, according to Cuvier, the second great division, or order, of Osseous Fishes, the species of which are distinguished by all the rays of the fins being soft and cartilaginous, exhibiting minute articulations, and often divided into small fibres at their extremities. It frequently happens however that the anterior ray of the dorsal or of the pectoral fins is hard and bony,—a character observable in nearly all the species of the *Siluridæ*, and in many belonging to other families.

The greater portion of the fishes of this order have the scales formed of simple laminæ, and with smooth margins; in this respect differing from the species of the *Percidæ*, *Sciænidæ*, &c., in which the edges of the scales are pectinated or serrated. The *Pleuronectidæ*, or Flat Fishes however, present the latter structure of scale, and yet, according to Cuvier, are placed in the *Malacopterygii*. M. Agassiz on this account removes this group to another section, and he also arranges the *Siluridæ* in another group, owing to the structure of their scales.

The *Malacopterygii* are divided into three sections. First, the *Abdominales*, in which the ventral fins are situated on the abdomen, far behind the pectorals. In the second section (*Subbrachiales*) the ventral fins are situated immediately beneath the pectorals, and the pelvis is suspended to the bones of the shoulder. In the third section (*Apodes*) the ventrals are wanting.

MALACO'STRACA (Μαλακόστρακα), a term employed by Aristotle to designate the *Crustacea* generally, but confined by Dr. Leach in his arrangement to the second order of the class. The *Malacostraca* of Leach are divided into three tribes:—1. *Brachyuri*, 2. *Macrouri*, 3. *Gasteruri*.

MA'LAGA, an episcopal town and seaport of the province of Granada in Spain, is situated in 36° 45′ N. lat., 4° 30′ W. long., on the shore of the Mediterranean, and has 52,000 inhabitants. The Guadalmedina, a mere brook in summer, but in winter a stream of considerable volume, enters the sea immediately to the west of the city. Malaga is of great antiquity. It was possessed successively by the Carthaginians, Romans, Goths, and Arabs. In 1487 Ferdinand and Isabella wrested it from the Moors after a siege of three months.

From the earliest ages, under all the nations who have possessed it, Malaga has been renowned

for its commerce. Its imports are colonial produce, broad cloths, cottons, laces, spices, hardware, and cutlery. Its exports amount to about 1,000,000*l.* sterling annually. They consist of wine, grapes, muscadel raisins, almonds, figs, lemons, olive oil, brandy, anchovies, and lead. Though the streets are narrow, tortuous, ill-paved, and dirty, the city has a gay and cheerful aspect, as the exteriors of the houses are whitewashed or painted yellow. Many of the roofs are flat, as in the East, and are surmounted by square towers with open galleries, where the citizens enjoy the cool sea-breezes. The city has several schools and public hospitals, an iron-foundry, and a large tobacco-factory. Malaga possesses a cathedral, a light and handsome building in the Greco-Gothic style, which is nearly 400 feet long, 180 broad, 125 in height, and is surmounted by a steeple 270 feet high. The harbour of Malaga is spacious enough to accommodate a large fleet; it is protected on the east by a massy stone mole, five furlongs in length, and terminated by a handsome light-house. The great boast of Malaga is the Moorish castle, built in 1279, and covering the slope of a hill immediately to the east of the city; it is of great extent, and still shows the effects of the Christian artillery in the siege of 1487.

MA'LALA, JOHN (called also Malela, or Malalas, or Malelas), was the author of a chronicle in the Greek language, in 18 books, which extends from the creation of the world to the reign of Justinian. He must have been alive after the reign of Justinian, since he mentions the number of years which that emperor reigned. The chronicle of Malala was printed for the first time at Oxford, 1691. The best edition is by L. Dindorf (Bonn, 1831), which contains the notes of Chilmead and Hody, as well as Bentley's letter to Mill.

MA'LAXIS, a genus of plants belonging to the natural order *Orchidaceæ*, and to the tribe *Malaxideæ*. Of this genus there is one British representative, *M. paludosa*. It is a small plant, with a stem from one to four inches in height.

MALAY PENINSULA constitutes the most southern extremity of the continent of Asia, extending between the Gulf of Bengal and the Straits of Malacca on the west, and the Gulf of Siam and the Chinese Sea on the east. It is united to the continent at its northern extremity. Its most southern points form the northern shores of the Straits of Singapore. Kwi Point, in the Gulf of Siam, and the mouth of the Tanasserim River, which enters the Gulf of Bengal, may be considered as constituting its northern boundary; they are situated near 12° N. lat. Cape Burus, the most southern promontory of Asia, in 1° 15′ N. lat., and Cape Romania, in 1° 17′, constitute the two extremities of the Straits of Singapore. The peninsula lies between 98° and 104° E. long. It is 750 miles long, with a width varying between 60 and 180 miles.

The peninsula is traversed by a mountain-range, which has several peaks 3000 feet high, while a few of the mountains attain a height of 6000 feet.

The comparatively small width of this peninsula and the disposition of the mountain-range prevent the formation of considerable rivers. The larges which are known are the Muar and the Pahang the former falls into the Straits of Malacca, an the latter into the Chinese Sea. The number o small rivers is very great, and there probably i no country better watered than this peninsula.

The climate differs on the eastern and wester sides of the peninsula, according to the peculia action of the monsoons. The eastern side is mos affected by the N.E. monsoon; the western i part by the S.W. monsoon, but is in part she tered from both monsoons.

The soil seems not to be distinguished by fe tility. The plants cultivated are chiefly ric pepper, cotton, coffee, and a great variety of fruit

Cattle are few in number, but buffaloes abound No sheep are kept; hogs and fowls are plentifu In the uncultivated tracts and woods tigers, le pards, and rhinoceroses are frequently met wit and sometimes elephants. Among the birds, tha kind of swallow which makes the edible nests i the most remarkable.

The most important articles of commerce ar from the mineral kingdom. Gold and tin ar plentiful, and are regularly exported.

The bulk of the population consists of Siames and of Malays. The former occupy the isthmu of Krah and the districts north of 6° 40′ N. lat and the latter the remainder of the peninsul [MALAYS.] The entire population is supposed no to exceed 1,000,000.

The northern part of the peninsula, as far sout as the bay of Chai-ya, is immediately subject t the King of Siam. On that bay are two harbour called Chai-ya and Bandon, and on the opposit western coast the harbour of Phunga or Pongo The district between the bay of Chai-ya and Cajo Patani is partly governed by Malay sovereign dependent on the King of Siam, and partly be longs immediately to Siam. The town of Liga is said to have 5000 inhabitants, Malays, Chinese and Siamese. The kingdoms of Calantan an Tringano on the eastern, and that of Queda o the western side of the peninsula are only nomi nally dependent on Siam. Tringano, situated a the mouth of the little river Tringano, seems t be a considerable place. Two other towns ar Queda and Alustar. The British colony of Pul Penang, or Prince of Wales Island, is partl situated within the kingdom of Queda. Th southern extremity of the peninsula is divided be tween the kingdoms of Pahang and Johore on th eastern side, that of Rumbowe in the interior, an those of Salangore and Perak on the wester coast, together with the British colony of Malacca These kingdoms are independent, and under th protection of the British.

(Marsden's *History of Sumatra;* Crawford' *Embassy to Siam and Cochin China;* Finlay son's *Journal of a Mission to Siam and Hué.*)

MALAYS, a nation of southern Asia, who oc cupy the shores of the Malay Peninsula, an the larger islands of the Indian Archipelago. I person the Malays are short, squat, and robus The face is of a round form, the mouth is wide and the teeth remarkably fine. The chin is rathe of a square form; the angles of the lower jaw

are very prominent. The cheek-bones are high, and the cheek consequently rather hollow. The nose is short and small, never prominent, but never flat. The eyes are small, and always black. The complexion is generally brown. The hair is long, lank, harsh, and always black.

The Malays have made considerable progress in civilisation, but more in the island of Java than on the other islands of the Indian Archipelago. They are well acquainted with agriculture and some of the mechanical arts. They have also made some progress in medicine and music. They are undoubtedly more civilised than any of the nations of southern Asia which inhabit the countries between China and Hindustan. Most of them are Mohammedans.

In the larger islands the Malay population generally occupies only the lower tracts along the coast, and the original inhabitants have retired before them into the interior. On the smaller islands the original inhabitants have been extirpated by them.

MALCOLM, SIR JOHN, G.C.B. and K.L.S., was born at Eskdale, Dumfriesshire, Scotland, in 1769. He went early to Hindustan, and was engaged in the wars against Tippoo Saib and the Mahrattas; but his chief employments, and those in which he most distinguished himself, were in his diplomatic missions to the Court of Persia. He was successively governor of Mysore and Bombay. He wrote a valuable 'History of Persia,' a 'Political History of India,' and a 'Life of Lord Clive.' He died in 1836.

MALDON. [Essex.]

MALE FERN, the rhizoma, incorrectly termed root, of the *Nephrodium Felix Mas*, has been celebrated from ancient times as an anthelmintic. The root-stock of young plants should be collected in spring or summer, and a fresh supply obtained every year, as a change occurs in the part a few months after being collected. It should be quickly dried, and preserved in glass or earthenware vessels in a dry place. The interior should exhibit a greenish colour, and possess a disagreeable odour, with a bitter, harsh, astringent taste.

It consists of an oil (which may be extracted by sulphuric ether), resin, tannin, sugar, starch, and woody fibre. The oil, which is of two distinct kinds, one pure and the other united with resin and an extractive, is the active principle. Formerly a powder of the whole substance was administered; but, as the dose of this is bulky, Peschier has recommended pills of the etheral extract, which are found to be very efficacious against that kind of tape-worm which is denominated the *Bothriocephalus latus*, or Broad Tape-Worm. The common mode of administering it is to give a certain number of pills at night, and a like number in the morning, followed by some brisk cathartic, as the male fern only kills but does not expel the worm.

MALEBRANCHE, NICOLAS, one of the most illustrious disciples of Des Cartes, who both gave to his master's views a wider development, and imparted to them clearness and vivacity, was born at Paris, 1638. His attention was directed to philosophy by accidentally meeting with the work of Des Cartes 'De Homine.' Abandoning his previous literary pursuits, he devoted ten years to the examination of the Cartesian philosophy, and he acquired the reputation of surpassing all his contemporaries in a knowledge of its true spirit and tendency. As the result of his philosophical meditations, Malebranch published, in 1673, the first book of the 'Recherche de la Vérité,' which was quickly followed by the other five. This work was greatly altered in the several subsequent editions: the most correct and complete edition is that which appeared three years before the author's death, which took place at Paris, in 1715.

The philosophical writings of Malebranche are both elegant and perspicuous: neither the clearness of the thought is sacrificed to the graces of composition, nor the ornaments of language to simplicity. If the profound originality of his ideas gained Malebranche any admirers, the novelty and boldness of his assumptions exposed him to much opposition.

The other works of Malebranche were partly controversial and partly religious. Of the latter we may mention the 'Entretiens d'un Philosophe Chrétien et d'un Philosophe Chinois sur la Nature de Dieu,' Paris, 1708; 'De la Nature et de la Grace,' Amsterdam, 1680. The following are of a mystical character, blending religion with metaphysics:—'Traité de la Morale,' Rott., 1684; and 'Entretiens sur la Metaphysique et sur la Religion,' Rott., 1688. A complete edition of his works was published at Paris, 1712, in 11 vols. 12mo.

MALEDIVA ISLANDS, commonly called the Maldives, lie in the Indian Ocean, and extend nearly on one meridian from 7° 6′ N. lat. to 0° 40′ S. lat., or nearly 550 miles; but in no part is the breadth of the chain supposed to exceed 50 miles in a direct line. The most northern group or Atoll is about 350 miles from Cape Comorin, the nearest point of Hindustan. The islands are believed to be 40,000 or 50,000 in number. They are inclosed and protected from the sea, which during the south-west monsoon is violently agitated, by narrow strips of coral reefs, which surround them like a wall. This protecting wall in many places scarcely reaches the surface of the water; in other places it forms a long sandy beach, perhaps less than six feet above the level of the sea, and is either circular or oblong. Each of these circular inclosures contains breaks, which constitute convenient passages for vessels or boats to enter. The number of these coral reefs is fourteen, thirteen of which are situated to the north of the equator. They lie on a long sand-bank, to the edge of which their outer sides extend, and beyond them there are no soundings. The channels which divide these Atolls, or Atollons (for so they are called), are in some places deep and safe, and are traversed by ships.

Within the Atolls the sea is not agitated by storms, and there are always soundings in twenty or thirty fathoms' water. The islands are generally situated along the inclosing coral wall, the central part of the Atolls containing only few of them. The islands are all small; not many of them exceed a mile in length and breadth, and a few

are less than half a mile. They are generally circular or lozenge-shaped. Many are mere narrow strips, 50 or 100 yards broad, forming a circle, which incloses a lower tract, filled up with broken coral rocks, and dry at spring tides. Within this ring there is sometimes a considerable depth of water, from one to ten fathoms, so that a perfect lagoon is formed. The highest part of the islands is from 6 to 14 feet above water.

All the islands are covered with a thick impenetrable jungle, among which there are many fine large trees. A little Indian corn, sugar, cotton, and millet are cultivated. There are few animals on the islands, but fish is abundant on the shores. The climate is pleasant, but not healthy to Europeans.

The inhabitants are Mohammedans. Two languages are in use among them; the common, which seems to be peculiar to the people, and the Arabic, as a learned language. They have also a peculiar alphabet. The whole population may amount to between 150,000 and 200,000. They carry on a little trade with Bengal. They are governed by a chief, called Sultan, who is proud of his dependence on the British at Ceylon. He resides on the Mali or Maldiva Atoll, which contains the largest of the islands, called Mali; its circumference is about seven mlles.

(Horsburgh, Owen, and Moresby, in the *London Geographical Journal*, vols. ii. and v.)

MALEIC ACID is another name for EQUISETIC ACID; it consists of $H^1 C^4 O^3$.

MALESHERBES, CHRETIEN' GUILLAUME DE LAMOIGNON, the associate of Turgot and those illustrious statesmen who sought by moderate reforms to prop the weakness of the old monarchy of France, was born at Paris, Dec. 16, 1721. Among other offices, he held those of president of the Cour des Aides, and minister of the king's household. When Louis XVI. was brought to trial, Malesherbes claimed the post of his defender. His fearless intrepidity entailed upon him the hatred and suspicions of the party in power, and he was guillotined April 22, 1794, meeting his fate with resignation.

The works of Malesherbes, who was a member of the French Academy and of the Academy of Belles Lettres and Inscriptions, are mostly on subjects of natural history and rural economy. His 'Discours et Remonstrances,' printed in 1779, are still quoted as authorities on financial questions.

MALESHERBIA'CEÆ, a natural order of polypetalous Exogens. The species are in many cases remarkable for the beauty of their yellow or blue flowers, and have been cultivated in this country, their seeds having been brought from Chili. They are however seldom seen, and are of no known use.

MALHERBE, FRANÇOIS DE, was born in 1555, at Caen, in Normandy. He accompanied Henri of Angoulême, son of Henri II., who went to Provence as governor in 1579, and remained attached to his household till that prince's death in 1585. He was patronised by Henri IV., upon whose death his widow, Mary de Medicis, settled a pension upon him. He died in 1628.

Malherbe has been styled by competent judges the restorer of the French language and poetry. The eulogium bestowed upon him by Boileau is well known:—

> 'Enfin Malherbe vint, et le premier en France
> Fit sentir dans les vers une juste cadence.'

MALIC ACID was discovered in 1785 by Scheele. It received its name from having been first obtained from the juice of apples, in which it exists in considerable quantity; but it also exists in many other fruits. Malic acid is colourless, inodorous, very sour to the taste, and acts strongly on vegetable blues; in a moist air it is deliquescent; it is very soluble both in water and in alcohol. Nitric acid converts it into oxalic acid. Its saline compounds are called malates, some of which exist in nature. They are not an important class of salts.

According to Liebig, malic and citric acids are isomeric bodies, both being composed of, when anhydrous, $H^2 C^4 O^4$.

The crystals contain one equivalent of water; whereas those of citric acid contain different proportions of it, according to the circumstances under which they are formed.

When malic acid is subjected to a heat of about 450° Fahr., it is decomposed, and the results are two isomeric pyro-acids and water, which are the maleic or equisetic and the fumaric or pyromalic acids.

MALINES. [MECHELEN.]

MALLARD. [DUCKS.]

MALLEABILITY is that property of certain metals which admits of their being extended by the blows of a hammer or by pressure. In this quality gold exceeds all other metals: thus the gold-leaf sold in books is so extremely thin, that less than 5 grains cover about 270 square inches, and the thickness of each leaf does not exceed $\frac{1}{200000}$th part of an inch. Metals which are malleable are also ductile, that is, they may be drawn into wire. Iron which has been made hot by hammering loses its malleability, and cannot be again hammered till it has been annealed.

MALLEA'CEA, or MA'LLEIDÆ, a family of monomyarian Conchifers or bivalve Shells, according to the system of Lamarck, most of the genera of which are to be found in the family *Margaritacea* of De Blainville. They belong to the *Ostracea* of Cuvier, and the *Oxygones* of Latreille.

Animal, with the mantle non-adherent, entirely open in its whole circumference, without tube or particular opening, prolonged into irregular lobes, especially backwards; foot canaliculated, and almost always furnished with a byssus.

Shell, black or horn colour, inequivalve, inequilateral, very irregular; hinge without teeth; marginal ligament sublinear, simple, or interrupted by crenulations; muscular impression subcentral, fixed generally by a byssus furnished by the animal.

We may enumerate the following genera:—*Posidonia* (fossil); *Vulsella* (seas of warm climates); *Crenatula* (seas of India and Australia, and also of South America); *Perna* (Indian Ocean); *Malleus* (East and West Indies, Austral-

asia); *Gervillia* (fossil); *Inoceramus* (fossil); *Catillus* (fossil); *Pulvinites* (fossil). Lamarck places *Avicula* [AVICULA] among the *Malleacea*, but M. de Blainville arranges it within the circle of his family *Margaritacea*, and M. Rang regards it as the type of a family which he terms '*Les Aviculés*.' The fossil species of *Malleacea* are very numerous.

(See Deshayes, Prof. Phillips, Mr. Lonsdale, Dr. Fitton, Dr. Mantell, Prof. Sedgwick, Sir R. I. Murchison, and others.)

MALLET, DAVID, was born about the year 1700, at Crief, in Perthshire, died 1765. He studied at the university of Edinburgh, made the tour of Europe as tutor to the sons of the Duke of Montrose, and ultimately settled in London. He is known from his ballad of 'Margaret's Ghost;' and his tragedies of 'Eurydice,' 'Mustapha,' and 'Elvira.' He was a man in whom want of principle and the absence of religion were the chief characteristics. He obtained one or two government appointments by prostituting his talent to party purposes, and attacked his friend Pope after his death, to whom he owed much of his good fortune. A collected edition of his poetical works was published by himself, in 3 vols. 8vo., in 1759.

MALLET, PAUL HENRI, born at Geneva in 1730, became professor of belles-lettres at Copenhagen. He was made a member of the academy of Upsala, and became also correspondent of the Académie des Inscriptions of Paris. He was afterwards appointed professor of history in the academy of Geneva. He died at Geneva, Feb. 8, 1807. His principal works are:—'Introduction à l'Histoire du Danemarc,' Copenhagen, 1755; 'Edda, ou Monumens de la Mythologie et de la Poésie des Celtes,' translated into English by Bishop Percy under the title of 'Northern Antiquities and the Edda,' 2 vols. 8vo., London, 1770; and 'Histoire du Danemarc.'

MALLORCA. [BALEARIC ISLANDS.]

MALLOW. [MALVA.]

MALLOW, MARSH. [ALTHÆA OFFICINALIS.]

MALMAISON. [SEINE-ET-OISE.]

MALMESBURY, WILLIAM OF, one of the most valuable of our old historians, is said to have been born in Somersetshire, about 1095 or 1096. When a boy, he was placed in the monastery whence he derived his name, where, in due time, he became librarian, and, according to Leland, precentor. He is generally supposed to have died about 1143. His principal writings are—'De Gestis Regum' (the history of the kings of England); 'Historiæ Novellæ' (the modern history); and 'De Gestis Pontificum' (the history of the prelates of England), containing an account of the bishops and of the principal monasteries, from the conversion of the English by St. Austin to 1125. These were published by Sir Henry Savile among the 'Scriptores post Bedam,' fol. 1596, reprinted, fol., Francof., 1601. English translations of these, and of some of his many other works, have been published.

MALMESBURY, JAMES HARRIS, EARL OF, was the only son of James Harris, the author of 'Hermes' and other well-known philological works. He was born at Salisbury, April 21, 1746. On leaving Oxford in 1765, he was sent for a year to study at Leyden. He then, after being eight months at home, set out in 1767 on a short continental tour; and in the autumn of the same year he was, through the patronage of Lord Shelburne, appointed secretary of embassy at Madrid. The temper and firmness, as well as talent, with which Harris had managed his negotiation with regard to the Falkland Islands, gave so much satisfaction to his government, that he was the following year appointed to the post of minister at the court of Berlin. He retained this mission for four years. In 1777 he was sent as ambassador to St. Petersburg, and, having in the mean time received the Order of the Bath in 1780, he remained in Russia till his health compelled him to return home in 1784. In 1788 Mr. Pitt offered Sir James Harris the post of minister at the Hague, which he accepted. While at the Hague, he succeeded in negotiating, in April 1788, the treaties of alliance with Holland and with Prussia, by which the power of the Stadtholder was at that time preserved from being overthrown by the democratic party. For this service, Sir James was raised to the peerage as Baron Malmesbury.

Lord Malmesbury continued to act with the Whig party in parliament till 1793, when he formed one of the body of the friends of Mr. Fox who went over to ministers with Burke and the Duke of Portland. Lord Malmesbury was now sent by Mr. Pitt on a mission to Berlin, where he prevailed upon the new King of Prussia to enter into a second alliance with England and Holland. In 1794 he was employed to negotiate the marriage between the Prince of Wales and Caroline, the daughter of the Duke of Brunswick; and accompanied her to England.

His last missions were in 1796 and 1797 to Paris and Lisle, to negotiate a peace with the French Republic, and which were attended with no result. In 1800 he was created Earl of Malmesbury and Viscount Fitzharris. He died in London, Nov. 20, 1820, leaving a son, who succeeded him in the title, and three daughters.

MALMÖ, a town in the Swedish province of Skane, division of Malmöläu, is situated about 55° 40′ N. lat., and near 13° E. long. It is built on the widest part of the Sound, nearly opposite the town of Copenhagen, on level ground, and has a good and safe harbour, protected by the fortress of Malmöhuus. The town is well built, and has regular streets. In the middle is a fine square, 166 yards long and 144 wide. The inhabitants, about 9000 in number, carry on an active commerce in corn. Cloth, stockings, hats, gloves, carpets, soap, leather, starch, and looking-glasses are made.

MALMSEY, a luscious and high-flavoured wine made in the island of Madeira from grapes of a peculiar kind, which are suffered to attain the last stage of ripeness before they are gathered. Malmsey wine has much body, and will retain its good qualities for a long time. When newly made, Malmsey Madeira is of the same golden hue as the ordinary wine of the island, but its

colour is materially deepened by age. Malmsey wine is also made in the island of Teneriffe, but the quality is greatly inferior to that of Madeira.

MALO, ST. [Ille-et-Vilaine.]

MALONE, EDMUND, was born at Dublin in 1741. After having taken a degree in the university of Dublin, he was called to the Irish bar in 1767. Mr. Malone was however devoted to literary pursuits. He took up his residence in London, and became distinguished principally as an editor of Shakspere. His first publication, connected with this his favourite subject, was that of a Supplement to Steevens's edition of 1778, in 2 vols., and in 1790 he brought out an edition of his own. Malone died in 1812. His posthumous edition of Shakspere, very carefully edited by his friend Mr. James Boswell, was published in 21 vols. 8vo., in 1821.

MALOPE, a genus of malvaceous plants, consisting of two species, one of which is commonly cultivated as a favourite hardy annual. This plant, *Malope malacoides*, is common in Barbary, where it is found among stones and rocks, which it ornaments with its large crimson flowers; it is also met with in Sardinia and other parts of the south of Europe.

MALPAS. [Cheshire.]

MALPIGHI, MARCELLUS, was born near Bologna, in 1628. He studied medicine in that university, and in 1653 received his doctor's degree. In 1656 he was appointed professor of medicine at Bologna, but soon after resigned, on being invited to a similar office in the university of Pisa. Declining health obliged Malpighi to return to Bologna, but in 1666 he went to Messina, where he held the professorship of medicine for four years. He then again resided near Bologna till 1691, when he was summoned to Rome, and appointed chief physician and chamberlain to Innocent XII. In 1694 he died of apoplexy.

Malpighi is now chiefly remembered in connection with his discoveries in the anatomy of the skin and of the secreting glands. He first described clearly the structure of the tongue. He proved that the colour of the skin depends on the rete mucosum, the cutis of white and of coloured races being always of the same rosy hue. Malpighi was the first who examined the circulation with the microscope. He published also some excellent observations on the chemical and other characters of the blood; and his works on the process of incubation, and on the structure and physiology of plants, though now almost forgotten, must have been very important additions to the knowledge of his day.

MALPIGHIA'CEÆ, a natural order of exogenous plants inhabiting various parts of the tropics. They are usually shrubs or trees, and but seldom herbaceous plants. Many of them are beautiful objects, especially the *Galphimias* and climbing species of *Hiræa* and *Banisteria*; a few only are useful. The fruit of *Malpighia glabra* is the Barbadoes Cherry of the West Indies: it varies in size, from that of a large pea to a small cherry; is smooth, shining, and has three triangular stones; its flesh is juicy and sweet, but insipid. The fruit of *Byrsonima coriacea*, or Lotus-Berry of the West Indies, is of much better quality; it is yellow, and contains a single stone. A few kinds produce timber of a bright yellow colour.

MALT is grain, usually barley, which has become sweet and more soluble in water, from the conversion of its starch into sugar by artificial germination to a certain extent, after which the process is stopped by the application of heat. The making of malt, called *Malting*, is thus conducted.

The barley is steeped in cold water for a period which (as regulated by law) must not be less than 40 hours; but beyond that period the steeping may be continued as long as it is thought proper. Here it imbibes moisture, and increases in bulk; at the same time a quantity of carbonic acid is emitted, and a part of the substance of the barley is dissolved by the steep-water. 100 bushels of grain, after being steeped, swell to the bulk of 120 bushels; and the quantity of matter which the steep-water holds in solution varies from $\frac{1}{50}$th to $\frac{1}{100}$th of the weight of barley. It consists chiefly of an extractive matter of a yellow colour and disagreeable bitter taste. After the grain has remained a sufficient time in the steep, the water is drained off, and the barley thrown out of the cistern upon the malt-floor, where it is formed into a heap called the *couch*, about 16 inches deep. In this situation it is allowed to remain about 26 hours. It is then turned by means of wooden shovels, and diminished a little in depth. This turning is repeated twice a day or oftener, and the grain is spread thinner and thinner, till at last its depth does not exceed a few inches.

When placed in a couch, it begins gradually to absorb oxygen from the atmosphere, and to convert it into carbonic acid, at first very slowly, but afterwards more rapidly. The temperature, at first the same with that of the external air, begins slowly to increase; and in about 96 hours the grain is at an average about 10° hotter than the surrounding atmosphere. At this time the grain, which had become dry on the surface, becomes again so moist that it will wet the hand, and exhales at the same time an agreeable odour, not unlike that of apples. At the time of this moistening, which is called *sweating*, the roots of the grains begin to appear, at first like a small white prominence at the bottom of each seed, which soon divides itself into three rootlets, and increases in length with very great rapidity, unless checked by turning the malt. About a day after the sprouting of the roots, the rudiments of the future stem, called *acrospire*, may be seen to lengthen. It rises from the same extremity of the seed with the root, and, advancing within the husk, at last issues from the opposite end; but the process of malting is stopped before it has made such progress.

As the acrospire shoots along the grain, the appearance of the kernel, or mealy part of the corn, undergoes a considerable change. The glutinous and mucilaginous matter is taken up and removed, the colour becomes white, and the texture so loose that it crumbles to powder between the fingers. The object of malting is to produce

this change: when it is accomplished, which takes place when the acrospire has come near to the end of the seed, the process is stopped by drying the malt upon the kiln. The temperature at first does not exceed 90°; but it is raised very slowly up to 140° or higher, according to circumstances. The malt is then cleared, to separate the rootlets, which are considered injurious.

The subsequent processes of brewing and distillation of spirits are described in the articles BREWING and DISTILLATION.

The quantity of malt charged with excise duty in the year ending Jan. 5, 1849, in the United Kingdom, was 37,546,157 bushels.

MALTA. The Maltese islands, in the Mediterranean, lie between 35° 49′ and 36° N. lat., and 14° 10′ and 14° 36′ E. long. Malta is 58 miles from the nearest point of Sicily, and 179 from Cape Demas, the nearest point of Africa. Its greatest length is 17¼ miles; its greatest breadth is 9¼ miles. The population in 1841 was 118,759, of whom about 11-12ths are Maltese. It contains two principal ports on the south-east side of the island, which are separated by a tongue of land a mile and a half long, on which are built the castle of St. Elmo and a light-house, commanding the entrance to both ports. This tongue of land is 200 feet above the level of the sea, but lowers towards the point, and is almost flat at the part where it joins the main land. On this advantageous position is built the modern city of *Valletta*, which is the seat of government, and the citadel of the island. It is so strongly fortified as to render the island almost impregnable. The whole works have embrasures and accommodation for upwards of 1000 guns.

The great harbour, which is to the eastward of Valletta, is about 3400 yards in length, with an entrance 450 yards wide, defended by a strong fort opposite the castle of St. Elmo, called Ricasoli, which crosses its fire, but is commanded by that castle. The harbour varies in width from 700 to 450 yards, and is surrounded by all the requisite buildings for a naval arsenal: it is one of the finest harbours and naval stations in the Mediterranean. The harbour to the westward, which is called Marsamuscetto (a word signifying, in Arabic, 'a place of shelter'), has at its entrance, opposite to and besides the castle of St. Elmo, a small but powerful fort called Fort Tigné. It is principally appropriated to vessels arriving from the Levant, and has a large quarantine establishment. Besides these two harbours, there are several bays which ships sometimes enter in stress of weather.

The whole of the southern coast of the island is by nature inaccessible. The rocks rise perpendicularly from the sea to the height of several hundred feet. The island slopes from the southern to the northern side.

The small islands of Gozo, Comino, and Filfla belong to the group of the Maltese islands. Gozo is 10 miles long by 5½ wide. In the centre of the island is a ruinous castle, at the foot of which is a populous town called the Rabbato. The other two islands are much smaller.

The scene on entering the port of Malta is one of the most striking and beautiful that can be conceived. This magnificent harbour is surrounded with bastions, over which appear handsome buildings and the towers of numerous churches, all built of stone, and presenting the cleanest and most brilliant appearance. On one side stands the city of Valletta, towering above the harbour, and on the other the three cities of Vittoriosa, Cospicua, and Senglea (commonly called the Borgo, Burmola, and Isola), which in fact form one continued town, covering the two spits of land which project from the eastern side of the harbour like pointing fingers, and forming the inlets or coves already mentioned. Valletta and these three cities compose the capital of Malta. Valletta is inhabited by official and wealthy persons, and the three opposite cities by manufacturers and traders. The eastern part of the island is separated from the western by a ridge of land which crosses the island to the westward of Valletta, and forms a natural fortification. The island is thus divided into two parts, of which the eastern contains the ancient capital and 22 casals or villages. *Città Vecchia*, or the old city, as it is commonly called, but the proper name of which is Città Notabile, is situate on a rising ground in the interior of the island, about six miles from Valletta, and was, before the foundation of the latter city, the capital of the island. It is still the seat of the bishopric, and contains the cathedral, a handsome modern edifice, built on the site of the ancient church. The city is walled, but is of no importance as a fortification. It contains many good and even magnificent buildings, but, with the exception of two large convents, the population is very trifling. A populous suburb, called the Rabbato, is inhabited by the dependents of many convents and ecclesiastical establishments in the neighbourhood, and by a large agricultural population. There are extensive catacombs cut in the calcareous rock. The parish churches of the casals are large and magnificent: they are built of the stone of the island, and, being isolated, and well situated in the centre of the habitations, display their architecture to advantage. Malta is chiefly supplied with water by rain, carefully preserved in tanks; but there is a magnificent viaduct, 8½ miles long, which brings water to Valletta from a spring.

The surface of Malta and Gozo is estimated at 114 square miles, or 72,960 acres, of which about two-thirds are cultivated, and the remaining third is bare rock. There is much good native earth in the valleys, which has been converted into productive fields; but a great portion of the land has been brought to its present state of culture by the industrious native, who with great labour and expense cuts away the hard surface of the rock, and frequently finds a quantity of earth lying inert in the crevices and interstices beneath. The produce of Malta is cotton (which is its staple), wheat, barley, pulse, potatoes, barilla, cumminseed, and sulla, or the French honeysuckle, which is used for fodder. As there is no meadow-land, much barley is cut when green for draught animals; and the straw (which is very fine) is a good substitute for hay. There are no wild

animals in the island, and, from the scarcity of pasture, very few cattle are bred. Meat is principally imported from Barbary. Horses are also imported, but some mules are reared, and the asses of Malta and Gozo are much prized, as are also the goats.

The roads in Malta and Gozo, generally speaking, are good, and communicate with all parts of each island. The inland modes of transport are by single-horse carts, and horses, mules, or asses of burden.

These islands are blessed with the steadiest climate in Europe. The worst feature about the climate is the peculiar sirocco wind which prevails for a few weeks in autumn. Malta is eminently fitted for the residence of English invalids from the beginning of October to the end of May.

The natives of Malta are a dark-skinned athletic race, and on that account, and from their Arabic dialect, have often been considered of African origin; but we look in vain for the Arab features. They are hardy and robust. The great bulk of the people who are not employed in field-labour are stone-cutters. The Maltese are also excellent seamen, and are esteemed such in all the ports of the Mediterranean.

The Italian language was introduced into these islands during the existence of the Sicilian government, and has ever since been in use, chiefly among the upper, but partly also among the middle classes of the inhabitants of the towns, in addition to their native tongue. The mother-tongue of the people, the Maltese, is used in the country parts and at Gozo, and also among the poorer classes in the towns. A knowledge of the English language is spreading in Malta. There are a university and a high school for the children of the upper classes, and many primary schools.

The religion of the people is the Roman Catholic. The Roman Catholic clergy and chapels are numerous. The Protestant clergy and places of worship (consequent on the occupation of the island by the English) are much fewer in number. A church was built on the island by Queen Adelaide about 1840.

Malta is a crown colony, and the local government is conducted by a governor, who, in legislative matters, is assisted by a council of six persons nominated by the crown. The courts of justice are numerous, and the procedure intricate and costly.

History.—The earliest notice of the Maltese islands is in Diodorus of Sicily (v. 12), in which he says that Malta was a colony of Phœnicians. It is supposed to have been afterwards occupied by the Greeks. The Carthaginians obtained possession of it in B.C. 402; and the Romans in B.C. 242. The Arabs seized it in A.D. 870; but in 1120 Count Roger, the Norman conqueror of Sicily, took possession of Malta, and expelled the Arabs. Malta was thus attached to the island of Sicily, and it became subject to the different dynasties which successively governed that island.

In 1516 Sicily, with the Maltese islands, passed to the Emperor Charles V., as heir to the crown of Aragon. On the 4th of March, 1530, Charles granted to the grand-master and religious fraternity of St. John, who had recently been expelled from Rhodes by the Turks, the ownership of all the castles, fortresses, and isles of Malta and Gozo, with complete jurisdiction. The sovereignty of Malta was by this grant in effect surrendered to the Knights, though the form of tenure from the crown of Sicily was maintained by the reservation of the annual payment of a falcon by the Knights to the King of Sicily or his viceroy. The Knights built formidable defences, and speedily improved the condition of the island. On the 9th of June, 1798, the French expedition to Egypt under Bonaparte, consisting of 18 ships of the line, 18 frigates, and about 400 transports, having 40,000 men on board, arrived off the island. The pusillanimity of the Grand Master, Ferdinand Hompetsch, and the treachery of some French Knights of the Order, led to the surrender of Malta to this force, although it was amply fitted for defence. The French government soon became so oppressive that the Maltese revolted, and they besieged the fortified cities from Sept. 1798 till Sept. 1800, whilst a blockade was kept up by sea by the Sicilians, Portuguese, and English. Captain Alexander John Ball, who commanded the squadron afterwards appointed by Lord Nelson to besiege Valletta, was in the beginning of 1799 elected by the Maltese as their chief, and the president of their congress. At length General Vaubois made proposals to surrender the place into the hands of the English troops. This act was signed and concluded on the 5th of September, 1800.

At the Peace of Amiens in 1802, it was settled between Great Britain and the French republic that the island should be restored to the Knights of St. John, and be an independent state as formerly, but with some modifications. Other political events prevented the fulfilment of this plan; and England remained in military possession of Malta till 1814. This was a period of great prosperity to the island, with the exception of a serious visitation of the plague in 1813. On the 30th of May, 1814, a definitive treaty of peace, concluded at Paris between France and the allied powers, fixed the lot of Malta, by a formal recognition of its subjection to the crown of Great Britain. But, as the cessation of the war opened the ports of Europe, Malta lost much of her recently acquired prosperity. As a military and naval station, it has ever since been kept up with great care; and, as a dependency or colony of England, many improvements in the internal government have been made since 1840.

MALTA, KNIGHTS OF, a celebrated military and religious order, known also by the names of Knights of St. John of Jerusalem, Knights Hospitallers, and Knights of Rhodes. The Order originated in an hospice which was founded at Jerusalem, about the middle of the eleventh century, for receiving the pilgrims from Europe who visited the holy sepulchre. When the crusaders under Godefroy de Bouillon took Jerusalem in 1099, several of them determined to join the institution, and to devote the rest of their lives to the service of the poor pilgrims. Godefroy de Bouillon made a donation of his own lord

ship of Montboire in Brabant to the hospice of St. John, and several other princes followed his example. The dress assumed by the new Hospitallers was black, with a white cross, having eight points or arms, on the left breast. Pope Paschal II. sanctioned the new institution, the members of which bound themselves by solemn vows of chastity, individual poverty, and obedience, to which was afterwards added that of being always ready 'to fight against Mussulmans and all others who forsake the true religion.' For nearly two centuries the Hospitallers, together with the Templars, were the firmest support of the Christians in the East; and when Acre, the last bulwark of Christendom, was taken by the Mussulmans in 1291, the remains of the Order withdrew to Cyprus. In the year 1310 they took possession of the island of Rhodes, and strongly fortified the town, from which they carried on by sea a deadly warfare against the Mussulmans. In 1522, Sultan Solyman the Great attacked Rhodes for the second time, and after an obstinate defence took it, and expelled the Knights, who found refuge in Italy. In 1530 Charles V. gave to the Order the islands of Malta and Gozo. After the surrender of Malta to the French, in 1798, the Order as a sovereign body became extinct.

MALTHUS, REV. THOMAS ROBERT, was born in 1766. He was entered at Jesus College, Cambridge, in 1784, proceeded B.A. 1788, and M.A. 1797; took orders, and undertook the cure of a small parish in Surrey. In 1798 he published 'An Essay on the Principle of Population, as it affects the future improvement of Society, with Remarks on the Speculations of Mr. Godwin, M. Condorcet, and other Writers;' but, finding that his facts and illustrations were imperfect, in 1799 he went abroad, and journeyed through Sweden, Norway, Finland, part of Prussia, France, and Switzerland, collecting materials for the 2nd edition of his work, which he published in 1803. This work, and his 'Inquiry into the Nature and Progress of Rent,' are the most important of his works. He published many pamphlets of temporary interest, and died in 1834.

MALTON. [YORKSHIRE.]

MALUS, ETIENNE LOUIS, was born at Paris, June 23, 1775. On the formation of the Ecole Polytechnique, Malus was admitted as a student, and on quitting the institution he was employed as a professor of mathematics in the military school at Metz; but, having an inclination for a more active life, he entered the corps of engineers with the rank of captain, and, in 1797, he was sent to join the army of the Sambre and Meuse. At the termination of the campaign, Malus went to Paris, and in the following year he embarked with the expedition to Egypt under Bonaparte. He was engaged there in various actions, and superintended the fortifying of Damietta.

In 1801 he returned to France, where he performed the duties of an officer of engineers. He married soon afterwards, and in 1810, he was made lieutenant-colonel. During the rest of his life, all the time he could spare from his professional avocations was spent in the cultivation of the sciences, particularly in optical investigations; and his first published work was entitled 'Traité d'Optique.'

In 1808, the Institute of France having offered a premium for the best Mémoire on the subject of double refraction in crystals, Malus entered zealously into this field of research; and, while prosecuting his experiments, he accidentally made the discovery, that when a pencil of light is reflected from unquicksilvered glass, at an angle of incidence equal to 54° 35′, or from the surface of water at an angle of incidence equal to 52° 45′, the reflected light possessed the same properties as were exhibited by one of the pencils produced by double refraction in a crystal. He observed also that when the pencil reflected from a transparent medium, at a certain angle of incidence, is made to fall on another such medium at an equal incidence, if the plane of the second reflection is coincident with the plane of the first, the light is reflected as usual; but, if the planes are at right angles to one another, no reflection takes place at the second surface, the pencils of light being wholly refracted.

To the effect produced on light so reflected, he gave the name of polarisation; and these phenomena may be said to have laid the foundation of a new branch of physical optics. Malus was immediately elected a member of the French Institute; and in 1811 the Royal Society of London awarded him the Rumford medal.

In 1810 Malus published at Paris his 'Théorie de la Double Refraction de la Lumière dans les Substances cristallisées;' and in the following year he presented two papers to the Institute on some remarkable phenomena of polarised light. He was soon afterwards chosen Examiner in Physics and Descriptive Geometry at the Ecole Polytechnique. He died in Paris, Feb. 23, 1812, in the 37th year of his age.

MALVA, a genus of plants belonging to the natural order *Malvaceæ*. *M. moschata*, the Musk Mallow, is native in many parts of Europe, and is found in Britain in grassy borders of fields and by waysides. *M. sylvestris*, Common Mallow, grows on waste places and road sides in Britain, and is native in most parts of Europe. The whole plant, but especially the root, yields when boiled a plentiful tasteless mucilage, which is used in some cases of internal irritation. Decoctions of the leaves are employed in dysentery, and in general for removing supposed acrimonious humours; but their chief utility is in clysters, fomentations, and poultices. This species is the Malva of Pliny. *M. rotundifolia*, Dwarf Mallow, is common in waste places in most parts of Europe, and is a native of Britain. *M. borealis* is found in Britain, near Hythe in Kent. There are many other species of Mallow. Those mentioned are the only natives of Britain, and the others are of little importance excepting as ornamental plants.

MALVA'CEÆ are a large natural order of exogenous plants. A large proportion of the order consists of herbaceous or annual plants, inhabiting all the milder parts of the world, but much the most plentiful in hot countries, where alone a comparatively small number of species become trees. In many cases they are remark-

able for the large size and beautiful colours of their flowers, which are however fugitive. Among the very numerous species several are of essential service to man. As emollients they are well known in medical practice, the Marsh Mallow (*Althæa officinalis*) being one of the most useful among this kind of remedial substances, and a large proportion of the whole order being capable of supplying its place. The hairy covering of the seeds of the various species of *Gossypium* forms the raw cotton so important to our manufacturers. The seeds of *Hibiscus abelmoschus* are warm and musky, and are employed in perfumery as a substitute for musk; those of *Hibiscus esculentus* are used in hot countries as a mucilaginous ingredient in soups. A few species are acid, especially *Hibiscus sabdariffa*. The tenacious fibres procured from the inner bark of many kinds of malvaceous plants are formed into cordage. *Hibiscus elatus* and *H. tiliaceus*, and several kinds of *Sida*, are principally used for this purpose.

MALVERN. [Worcestershire.]

MALWA. [Hindustan.]

MAMELUKES, or MEMLOOKS, the name of a military body which for a long time ruled Egypt. They were first instituted in the early part of the thirteenth century by Malek Salach, grandson of Safadeen, which Safadeen was the brother of the famous Salah Edeen, the Koord, the founder of the Eyoob dynasty of the sultans of Egypt, which succeeded the Fatimides. In 1517 Sultan Selim I. subdued Egypt, and put to death Tomaun Bey, the last of the Circassian dynasty. A Pasha, who resided at Cairo, was appointed by the Porte; but the Beys of the Memlooks, twenty-four in number, were the governors of as many districts, and continued almost independent of the Porte till Bonaparte's invasion, when the battle of the Pyramids, in July 1798, destroyed their power. After the English and the Turks had reconquered Egypt in 1801, the Captain Pasha treacherously murdered several of the beys whom he had invited to a conference. At last, in 1811, Mehemet Ali, pasha of Egypt, by a similar contrivance, destroyed nearly all the remainder of them in the citadel of Cairo, and they are now extinct as a body. The Memlooks were recruited entirely from Caucasian slaves.

MAMERS. [Sarthe.]

MAMMA'LIA (by some anglicised into the term *Mammals*) is a term employed by Linnæus to designate all those animals which give suck to their young.

In the mammalia, the nervous system is concentrated in a true brain (*cerebrum* and *cerebellum*), and a spinal cord; the heart consists of two auricles and two ventricles; the blood is red and warm; the respiration is atmospheric; the lungs are free in a true chest; the jaws are furnished, as a rule, with true teeth; the limbs are usually four, sometimes two; habits arboreal, terrestrial, or more or less aquatic, and the limbs accordingly modified.

Within the class of the mammalia the porpoises, whales, lamantins, and dugongs are included, animals essentially aquatic as far as *habitat* is concerned, but no farther.

MAMMA'LOGY, the science which has for its object the study and classification of the Mammalia. [Anatomy, Comparative; Animal.]

MAMMARY GLAND is an organ of considerable interest from its occurring only in that important class of animals to which it gives its name [Mammalia], and whose greatest peculiarity is that, while young, their food is the milk secreted by the mammary glands of their mother.

The number of mammary glands varies in different animals. They are composed of ramified ducts which open on the surface of a nipple or teat by a very minute orifice. In some animals, as ruminants, there is but one orifice at the extremity of each nipple; in others, and in man, there are several. Each orifice leads into a fine canal, which however soon dilates, and ramifies with irregular and tortuous branches in the substance of the breast or udder. Each branch has either a simple closed extremity or terminates in a minute cellule, and numerous capillary blood-vessels ramify on their walls and secrete the milk into them. When the mouth of the young animal, by the action of sucking, produces a partial vacuum over the nipple, the weight of the surrounding medium presses lightly and equally upon the surface of the breast or udder, and propels the milk from the ducts in minute and gentle streams.

At the commencement of pregnancy, the mammary gland, which up to the period of puberty had been but little developed, enlarges; its increase of size keeps pace with the progress of gestation, and before its termination a thin serous milky fluid begins to be secreted. Directly after parturition, the quantity of milk increases, and it becomes more thick and rich, combining in itself all the best principles for the nourishment of the young animal. It continues to flow for a length of time, proportioned to the age at which the young animal can seek its own food, and then gradually subsiding, the gland decreases to the same size which it had before pregnancy.

In males of all species only a rudiment of this organ is found; yet there are not wanting instances in which milk has been secreted from the breasts of men and other male animals. (Blumenbach.)

MAMMEA, a genus of the natural family of *Guttiferæ*, so called from the American name *Mamey* of *Mammea Americana*, or the American Mammee-Tree, which is the only species of the genus, and forms a handsome tree with a spreading and elegant head, which is compared with that of a Magnolia. The flowers are odoriferous. The fruit is large, and has a double rind, of which the outer is thick and leathery; the inner thin and bitter, and contains the pulp closely adhering to it, which is of a yellow apricot colour. This pulp has a pleasant but peculiar taste, with an aromatic smell. It may be eaten raw, or cut in slices to eat with wine or sugar; or cooked which deprives it of its gummy portion. It is also preserved in wine sweetened with sugar, or in brandy.

MAMMOTH, a term employed to designa

the fossil elephants. The name has been erroneously applied sometimes to the Mastodon. [ELEPHANT.]

MAMUN. [ABBASIDES.]

MAN constitutes the sole specific example of the only genus, *Homo*, contained in Cuvier's order *Bimana*.

The anatomy and physiology of man are treated of under their appropriate heads in this work. The present article is limited to the consideration of man as an object of natural history.

In man the attitude is erect. The skull is nearly balanced upon the vertebral column, which, though not absolutely straight, yet has its curves so arranged, that when the body is in the erect posture a vertical line drawn from its summit would fall exactly on the centre of its base. The naturally erect position of man requires an expansion of the os sacrum and haunch bones, for the lodgment of powerful muscles; and the strength and size of the lower limbs are such as not only to support with ease the weight of the body, but also to insure firm, easy, and graceful progression; the foot is broad; the leg bears vertically upon it; the heel is tumid beneath,—the toes are short, the first far exceeding the rest in magnitude; it is placed on the same line as the others, and is not opposable to them. Man is truly bipedous and plantigrade.

The lower limbs of man being the exclusive organs of locomotion, at least on the ground, his anterior extremities are free. The arms are well developed and muscular; the humerus rotates freely in the shallow articulating cavity of the scapula; the shoulders are kept wide apart by means of well-developed clavicles; the fore-arm is capable of pronation and supination; and the hand is at once an organ of touch and prehension; the thumb is truly opposable to the fingers, which are of unequal length, for the sake of insuring easier manipulation and greater precision. No other animal has a true hand. (Sir C. Bell's 'Bridgewater Treatise on the Hand.')

In man the chest is large and expanded; it is flattened in front, and has greater dimensions transversely than in depth; the sternum is short and broad; the ribs are, on each side, 7 true and 5 false, total 12. Mammæ 2, pectoral. The teeth of equal length and approximating together, without intervals:—Incisors, $\frac{4}{4}$; Canines, short, $\frac{1-1}{1-1}$; Bicuspid Molars, $\frac{2-2}{2-2}$; True Molars, bluntly quadricuspid, $\frac{3-3}{3-3} = 32$.

Food,—fruits, grain, roots, and animal flesh cooked; as a general rule, the diet of man is prepared by cooking for the stomach. In the colder regions oleaginous animal food is preferred; rice and farinaceous food in the hotter climates; and various are the degrees between these two extremes, according to latitude and national predilections.

Growth, slow; infancy, long; maturity acquired at a comparatively late period.

Skin, smooth. Natural offensive or defensive weapons denied by nature. Everywhere man uses artificial weapons: the club, the spear, the bow, the knife, and the hatchet are the weapons of savages.

The Nervous System is highly developed; the brain is large, convoluted, complex, with the cerebral hemispheres greatly preponderating. The mass of the brain is voluminous in proportion to the size of the nerves communicating with it. In consequence of the volume of the brain, the amplitude of the cranial portion greatly preponderates over the facial. Man has no projecting snout; the face is nearly on a plane with the rising forehead, and therefore below and not anterior to the brain; this position is peculiarly characteristic of man, for the crania of the chimpanzee and orang, which approach nearest to that of man, are altogether posterior to and not above the face. This form, at the same time that it remarkably distinguishes the human from the brute features, is exactly adapted to the erect attitude. In that posture the plane of the orbits is nearly horizontal; the cavities of the nose are in the best direction for inhaling odours, proceeding from before or from below them; the jaws do not project in front of the forehead and chin. But, suppose the posture changed, as painful an effort would be required to examine an object in front of the body as is now necessary to keep the eyes fixed on the zenith, and the heavens would be almost hidden from our view; the nose would be unable to perceive any other odours than those which proceeded from the earth or from the body itself; and the teeth and lips would be almost useless, for they would scarcely touch an object on the ground before the forehead and chin were in contact with it; while the view of that which they attempted to seize would be obscured by the nose and cheeks.

Man is the only animal endowed with the gift of language, as distinguished from mere sounds instinctively uttered, and expressive of feelings or desires.

Man is a true cosmopolite—he inhabits the dreary regions of the polar circle, the temperate latitudes, and the glowing countries of the tropics. He subsists with equal facility under various degrees of atmospheric pressure; the valleys and also the elevated table-lands of South America, some of which are 10,000 feet high, are alike inhabited by man,—the barometer standing in the one at 30, and in the other at only 20 inches. Condamine and Bouguer with their attendants lived for three weeks at a height of 14,600 French feet above the level of the sea, where the barometer stood at only $15\frac{3}{4}$ inches, the atmospheric pressure being therefore only a little more than half of that to which they had been accustomed.

Considerable differences occur in the average stature of different races. The Bushmen, for example, of Southern Africa are mere pigmies, the Caffres of the same country are tall and athletic; the Esquimaux are stunted; the Patagonians are often 7 feet in height. In all countries individuals are to be found some far below the average standard, some far exceeding it; but these are examples of accidental departure from it. In tem-

perate climates the average stature of the male varies from 5 feet 6 inches to 6 feet.

The great family of man is divided into a vast number of races or varieties, distinguished from each other by physiognomy and slight structural details, by colour, by the characters of the hair, by language, by habits, manners, and customs, and by degrees of civilisation. A singular morbid variety of man occurs in all countries, but perhaps most frequently in hot climates. They are termed *Albinoes*, and are distinguished by the total absence of the colouring matter of the cuticle, hair, and eyes—hence their skin is of a milk-white or pinkish hue, the hair silky, white, or at most yellowish; the iris rosy, and the pupil red. Albinoes occur among our domestic quadrupeds: White Rabbits and White Mice are examples.

MAN, ISLE OF, is situated between 54° 4′ and 54° 27′ N. lat., and 4° 17′ and 4° 43′ W. long.; 34 miles from St. Bees' Head in Cumberland; 16 from Burrow Head in Scotland; and 28 from Strangford in Ireland. Its length N.N.E. to S.S.W. is about 30 miles; its breadth varies from about 8 to 11 miles, but is much narrower at its extremities; and its circumference is about 75 miles. The area is about 220 square miles. The population in 1841 was 47,975. The Calf of Man is a small island situated to the south-west of the island, nearly a mile from it, and from 3 to 5 miles in circumference. The Kitterlins, another small rocky island, is situated between the Isle and Calf of Man.

The island is intersected by a ridge of hills, which runs from north-east to south-west nearly through its whole length, and chiefly occupies the central parts. The hills compose three chains, separated from each other by high table-lands, and crossed by three very narrow openings. Snafield, the highest point of them all, is 2004 feet above the level of the sea, and North Barrule rises to 1804 feet. The mountains, commons, and waste lands are supposed to cover 50,000 acres, leaving above 90,000 acres for cultivation. England, Scotland, Ireland, and Wales are visible from the summits of the mountains on a clear day. The Neb, Sulby, and other streams which flow from the mountains, enter the sea at Peel, Laxey, Douglas, and Ramsey. The coast is in many places very precipitous.

Rocks of mica-slate and clay-slate compose all the mountains. A considerable quantity of roofing slate and building stone is exported from the island. Lead and copper are found in Snafield. Granite and other boulders are scattered about the island.

The soil in the south part of the island is a light clay formed by the decomposition of the clay-slate. The mountainous district is adapted only for pasture, and judicious culture alone can render the hilly parts productive. The northern part is more fertile. The climate is temperate. The agriculture of the country, in consequence of the attention paid to the herring-fishery, was formerly left very much to the women, who were accustomed to perform all the hard work of a farm, and frequently without their aid the corn itself would have been unthrashed; but great improvements have been introduced in late years. The largest part of the island is in the hands of yeomen, who farm their own estates, which are from 10 to 200 acres.

The early history of the Isle of Man is obscure. It was governed by a succession of Norwegian kings, until Magnus, finding himself unable to preserve the Western Isles, sold them to Alexander III., king of Scotland, A.D. 1264. The Isle of Man soon afterwards passed into the hands of the English; and in 1307 Edward II. bestowed this island first upon the Earl of Cornwall, and then on Henry Beaumont. It passed through many hands until it came to the Stanleys, earls of Derby, who retained the title of Lords of Man. James, earl of Derby, in consequence of his adherence to Charles I., was taken prisoner, and executed at Bolton, in 1651. His wife defended Castle Rushen, to which she retired, until Christian, on whom she relied, and who had the command of the forces, capitulated to Birch and Duckinfield, who had invaded the island with ten vessels. After a few more changes, the island finally became a portion of the British territory, by the purchase of the rights of the last surviving lord, the Duke of Athol.

No part of the kingdom abounds so much in Danish remains. The various tumuli, barrows, weapons, coins, and Runic characters afford clear evidence of the connection which the Northmen had with this island. Rushen Abbey, St. Bridget's Abbey, and the tumulus of Tinwald are among the most interesting relics of antiquity.

The principal towns in the island are Castletown, Douglas, Peel, and Ramsey.

Castletown is situated in the south-west of the island; it is a neat town, with regular streets. It contains two or three chapels and a well-conducted college. The remains of Castle Rushen are in this town. The population in 1841 was 2283. The courts of chancery and common law are held in Castletown, and it is the residence of the governor. The House of Keys meet here.

Douglas is situated on the south-east coast of the island, on a bay which extends three miles in the form of a crescent, and is sheltered from all winds except the south-east. The old streets are generally very irregular, but some modern streets are regularly built. Castle Mona, built by the Duke of Athol, and a number of good mansions, give a pleasant appearance to this town. Paper, linen and woollen manufactures are carried on. The population in 1841 was 8647. There is a pier 520 feet long.

Peel, formerly called *Holm Peel*, is on the west coast of the island. The castle, which is built on a small rocky island, incloses an irregular space of more than two acres, and is separated from the town by a narrow channel, scarcely a foot deep at low water. Peel has only one church. The population in 1841 was 2133.

Ramsey is situated on a spacious bay, where there is safe anchorage, on the north-eastern coast of the island. It is built in a straggling and irregular manner. In this town the courts of law for the north part of the island are held. The population in 1841 was 2104.

The herring-fishery is one of the chief occupations of the people. In 1844, the fishing boats employed amounted to 352, with a tonnage varying from 14 to 21 tons. The vessels which entered the ports of the island in 1845 amounted to 1535. The British and Irish produce and manufactures exported thither in 1843 amounted in official value to 73,262*l.* Steam communication is maintained with the three kingdoms.

The established religion is that of the Church of England, but all denominations of Christians have the free exercise of their religion. The episcopal see is supposed to have been fixed at Sodor in the ninth century, but the site of this place is not now known. The Bishop of Sodor and Man, whose authority is wholly confined to this island, is a suffragan of the Archbishop of York. He has an archdeacon and his assistant, two vicars-general, and an episcopal registrar; and he holds also an ecclesiastical court, a convocation, and a consistorial court.

All the laws of the island are contained in one small volume. There are no barristers, and the services of the attorneys, who act both as attorneys and barristers, are in many cases rendered unnecessary by the clients pleading their own causes. Law is cheap, and litigation is common.

The House of Keys, which has both a legislative and judicial character, consists of 24 of the principal commoners of the island. They must have landed property, and have attained the age of twenty-one. They are now a self-elected body, but were formerly chosen by the people, and were the organ by which they acted. The two deemsters have equal jurisdiction, and are judges in civil and criminal cases. There is a Court of Chancery, a Court of Exchequer, and six common-law courts. In these latter, all disputes about land, and all personal actions for the recovery of damages, are tried before a jury. The deemsters administer the oath in the Manx language, deliver the charge, and receive the verdict. There is an appeal from the judgment of a court of common-law, first to the House of Keys, afterwards to the governor, and finally to the privy-council. Petitions have recently been presented for a reform in the peculiar constitution and legislation of the island.

Schools, both in the English and the Manx tongues, have been established in various parts of the island.

(Townley's *Journal in the Isle of Man;* Feltham's *Tour through the Isle of Man;* Wood's *Account of the Isle of Man; Parliamentary Papers.*)

MANAAR. [Ceylon.]

MANAKINS, the name of a group of small birds remarkable for the rich tints of their plumage (*Pipra* of authors).

MANCHA, LA. [Castilla-la-Nueva.]

MANCHE, LA, a department in France, consisting of the peninsula of Cotentin and the district of Avranchin, parts of the former province of Normandie, is bounded S. by the departments of Ille-et-Vilaine and Mayenne, E. by those of Orne and Calvados, N.E., N., and W., by the English Channel, which is called in French La-Manche, whence the department takes its name. Its greatest length from N. to S. is about 90 miles; its average width is about 27 miles. The area is 2292 square miles, and the population in 1846 was 604,024, which gives 263.53 to the square mile, being 89.78 above the average per square mile for all France.

The department is traversed from S. to N. by hills of no great elevation, which branch off from the Armoric chain, and terminate northwards in Cape La-Hague. These hills slope down gradually towards the coast on the eastern and western sides of Cotentin, in some places presenting bold cliffs against the sea, in others subsiding into sands and beaches of vast extent, which are always covered at full tide. Along the coast there are several harbours and roadsteads, the most important of which are—Cherbourg, La-Hougue, Granville, Regneville, Carteret, &c. Among the numerous islands that stand in near the coast, besides the Channel Islands, are—Mont-St.-Michel, the Chaussey group, Pelée N.E. of Cherbourg; and Tatihou and St. Marcouf, on the east coast of Cotentin. Most of these islands are fortified and garrisoned; many of them, traditions say, were once joined to the main land. From the nature of the surface the rivers must be all of short course: the principal are the Vire [Calvados]; the Taute and the Douve, which empty their united waters into the great sandy bay between Isigny and Carentan; the Ay, the Tienne, the Célune, and the See, which terminate on the western coast; and the Couësnon [Ille-et-Vilaine], which in the lower part of its course, separating La-Manche from Ille-et-Vilaine, falls into the bay of St.-Michel. The department is crossed by 9 royal, 25 departmental, and a great number of parish, roads. The climate is mild but moist.

The department yields more of bread-stuffs than suffices for the consumption. Wheat, barley, rye, buck-wheat, black oats (cakes made of which form the chief food of the labouring class), and potatoes are the chief crops. Apple and pear trees are extensively cultivated for making cider and perry, the favourite beverages of the country. Of cider above 22,000,000 gallons are made annually; some of it, especially that made near Avranches, is of excellent quality. Hemp and flax are grown in considerable quantity on the eastern slopes of Cotentin. Fruits of various kinds are sedulously cultivated in the arrondissement of Avranches. Horses of the true Norman breed are numerous, and fetch the breeder good prices; they are much sought after as cavalry horses. The pastures are good and extensive, affording food for a great number of horned cattle of large size and excellent fatting qualities. Excellent butter is made, and large quantities of it are exported from Isigny. A considerable number of sheep are fed on the sandy plains (locally called *mielles*) which extend between the sea and the cultivated land; they are small, and have sweet flesh. Game, water-fowl, and fish of all kinds are abundant.

The department is rich in minerals. Iron, lead, and coal mines are worked; granite and building stone are quarried; marble, slate, potters' clay,

and limestone are found. Mineral springs are numerous; there are a few salt marshes along the coast.

Manufacturing industry is actively exerted in the making of iron, the working of zinc and copper, the fabrication of plate glass, serge, calico, drugget, cutlery, woollen stuffs, lace, tape, hair-cloth, porcelain, oil, hardware, cotton yarn, paper, leather, soda made from kelp, basket-work, &c. Ship-building is actively carried on at Cherbourg and other towns on the coast. The articles enumerated and the products of the soil support an active commerce and coasting trade. The chief exports are fresh and salt fish, corn, cattle, horses, poultry, wax, honey, salt butter, feathers, salt, salt provisions, soda, &c. About 380 fairs are held in the year.

The department contains 1,467,308 acres, distributed among 193,057 proprietors, and into 1,586,088 parcels. Of the whole area 949,290 acres are under tillage; 227,483 are meadow and pasture land; 59,201 acres are covered with woods and forests chiefly of oak, beech, and birch; 50,063 acres are laid out in gardens, orchards, and plantations; 114,394 acres consist of heaths and moors; 46,299 acres are occupied as roads, streets, squares, &c.; 6,657 acres are covered with waters; and 13,663 with houses and buildings.

The department is divided into 6 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
St.-Lô . . .	9	130	100,208
Coutances . .	10	139	132,857
Valognes . .	7		93,857
Cherbourg . .	5		83,329
Avranches .	9	127	117,909
Mortain . . .	8	73	75,864
Total . .	48	669	604,024

In the arrondissement of St.-Lô, the chief town is St.-Lô [Lô, ST]. *Carentan*, a town of 2990 inhabitants, is situated near the coast among unhealthy marshes on the left bank of the Taute. It was formerly defended by a strong castle, a great part of which remains; this castle was taken by Edw. III. in 1346. *Percy*, S.W. of St.-Lô, has a population of 3215. *Torigny*, S. of St.-Lô, a small well-built town of 2186 inhabitants, is famous for its ancient castle, which before the revolution of 1789 was considered the finest building of the kind in Normandie.

In the arrondissement of Coutances, the chief town *Coutances*, the capital of the old district of Cotentin, is built on a hill extending N. and S. about 4 miles from the sea, to which it is joined by the Saule Canal. It is in general ill-built, with narrow crooked streets, but the situation is very picturesque. The town is said to have existed in Roman times, and to have taken its name from Constantius Chlorus, who fortified it and built the aqueduct now called les-Piliers from the Roman arches of it still remaining. The principal buildings are the cathedral, which is universally admired, the churches of St.-Nicholas and St.-Pierre, the prison, and the theatre. Coutances is the seat of an assize court, of tribunals of first instance and of commerce; it gives title to a bishop, and has communal and theological colleges, and 7920 inhabitants. The industrial products are cutlery, parchment, drugget, muslin, &c.; the chief trade is in corn, butter, poultry, eggs, cattle, horses, hempen and flaxen thread, wool, feathers, &c. *Cerisy-la-Salle*, 7 miles from Coutances, has a population of 2327; there are several druidical monuments near it. *Gavray*, famous for its long resistance to Du-Guesclin, stands a few miles S. by E. from Coutances, and has 2014 inhabitants. *Périers*, N. of Coutances, has a population of 2856.

The arrondissement of Valognes is named from its chief town *Valognes*, which stands in a pretty valley a few miles S. by E. from Cherbourg, and has a tribunal of first instance, a college, and 6445 inhabitants, who manufacture lace and porcelain. The principal building is that in which the college and public library are established, and which was formerly a theological seminary. *Barfleur*, an important seaport in the time of the Norman kings of England, stands on the eastern shore of the peninsula of Cotentin; it is now a mere fishing village with 1185 inhabitants, and has a harbour capable of admitting only small craft. *Briequebec* situated in a forest of the same name W. of Valognes, has a handsome church, an ancient ruined castle, and 4484 inhabitants. There are several iron mines and mineral springs near this town. North-east of Valognes on the eastern coast of Cotentin is the fortress of *La-Hougue*, which is built on the isthmus of a peninsula terminating in Cape La-Hougue, and defends the roadstead of La-Hougue. The roadstead is marked out by three lights, one of which is on the fort of La Hougue. Off the cape on the 29th of May, 1692 the French fleet, under Admiral Tourville, was completely defeated by the combined fleets of England and Holland. *Montebourg*, S.E. of Valognes, has 2502 inhabitants, who manufacture lace, cutlery, and leather. *Sainte-Mère-Eglise*, S. of Montebourg, on the road to Carentan, has a population of 2894. *St.-Sauveur-le-Viscomte*, a well-built town prettily situated on an eminence above the Douve, has 2774 inhabitants.

In the arrondissement of Cherbourg the chief town is CHERBOURG. *St.-Pierre-Eglise*, a small town E. of Cherbourg, has 2203 inhabitants, who manufacture linen and leather. *Les-Pieux*, a small place built on a hill near the west coast of Cotentin, is remarkable for the extensive view from it in which are included the islands of Guernsey and Jersey, and 20 churches on the peninsula.

Of the arrondissement of Avranches the chief town is AVRANCHES. *Brécey*, E. of Avranches near the right bank of the See, has 2452 inhabitants. *Granville*, a seaport and walled town N.W. of Avranches, has a tribunal of commerce, a naval school, and 8347 inhabitants. The town stands on a rocky promontory and has a well sheltered harbour, which however is always dry at low water. Works are now in progress for the improvement of the harbour generally, and for the construction of wet docks and quays. The stree

of the town are narrow and steep; the only remarkable building is the parish church. The inhabitants of Granville are enterprising seamen, and are largely engaged in the coasting trade and in the cod, herring, whale, and oyster fisheries. They export corn, flour, butter, cider, poultry, cattle, granite blocks, &c., and import wine, brandy, colonial produce, drugs, salt, hemp, soap, oak and deal planks, iron, &c. Ship-building is carried on. *Pontorson*, a town of 2000 inhabitants, stands near the mouth of the Couësnon, which separates Normandie from Bretagne. Near it is the isolated and fortified rock of *Mont-St.-Michel*, on which stands the famous abbey dedicated to St. Michael the Archangel. The abbey buildings, after the first French revolution, were made a prison for nobles and priests; it afterwards became and still is a central prison for several departments. The abbey church, which springs from the centre of the other buildings, and crowns the summit of the rock, is greatlyadmired for the beauty of its Gothic architecture. *St.-James*, S. of Avranches, on the Beuvron, has a population of 3236, who trade in corn, cattle, flax, and hemp. *Villedieu*, N.E. of Avranches, has 3763 inhabitants, who manufacture hardware and plated goods, lace and leather.

The arrondissement of Mortain is named from its chief town *Mortain*, which is situated in the S.E. of the department, and has a tribunal of first instance, a college, and 2523 inhabitants. The church of Mortain, founded in 1082, is a remarkable structure; the castle that formerly stood on the hill above the town is now a heap of ruins. *Barenton*, S.E. of Mortain, has a population of 3086. *St.-Hilaire-du-Harcouet*, near the confines of Normandie, Bretagne, and Maine, has large markets for the sale of the cattle, corn, and other produce of these provinces; population, 2994. *Sourdeval-la-Barre*, N. of Mortain on the See, has several paper-mills, manufactures of cutlery and hardware, and a population of 4339. *Le-Teilleul*, on the borders of Mayenne, 9 miles S. from Mortain, has 2539 inhabitants.

The department forms the see of the Bishop of Coutances; is included in the jurisdiction of the High Court and University Academy of Caen; and belongs to the 14th Military Division of which Rouen is head-quarters. Under the late monarchy it returned 8 members to the Chamber of Deputies, it now has 13 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1849.)

MANCHESTER, a large manufacturing town in Lancashire, a municipal borough, and a parliamentary borough, is 168 miles N.W. by N. from London, direct distance, and 197½ miles by the London and North-Western Railway. The parish of Manchester comprises several townships. Under the Reform Act Manchester sends two members to parliament, and contained in 1841 a population of 240,367. Under the Municipal Act the borough has a commission of the peace, is divided into 15 wards, has a mayor, 16 aldermen, and 48 councillors, and contained in 1841 a population of 242,983, exclusive of the suburb of Salford, which had a population of 53,200, making the entire population 296,183. Salford is also a separate parliamentary borough, which returns one member, and contained in 1841 a population of 66,624. In 1848 Manchester was made the see of a bishop.

Manchester stands on the south-east bank of the river Irwell, by which it has a communication with the Mersey, Liverpool, and the ocean. It is situated in a district which contains some excellent coal strata, a circumstance to which the place is in no small degree indebted for its prosperity.

The town is not distinguished for architectural beauty; its chief streets are occupied with warehouses and shops, the opulent inhabitants residing at a greater or less distance from the centre of the town, in dwellings separate from those in which they conduct their business, many of which are spacious and beautiful. There are however some objects of architectural interest in Manchester. Under the sanction of acts of parliament much has been done for the improvement of the town, both in convenience and appearance. Market Street, Mosley Street, and a few other streets in the neighbourhood, have fine rows of shops and warehouses, and some fine public buildings.

Manchester has the credit of having given an impulse to our means of internal communication, and has reaped an ample reward. The achievements of Brindley were prompted by the desire which the Duke of Bridgewater had of sending his coal from Worsley to Manchester at a small expense; and Manchester now possesses the means of water-communication with almost every part of the country. In the railroad enterprise Manchester has held a prominent station. It furnished its full share of the capital employed in the formation of the Manchester and Liverpool Railway; and it is now the centre of a system of railways radiating in six different directions. There are two magnificent viaducts across the town, for connecting the Liverpool line with the Yorkshire and the London lines.

Cotton is the chief article employed in the manufactures of Manchester. Of late the spinning and weaving of silk have been introduced, and it has manufactures of woollens, small wares, hats, umbrellas, and of machinery, which last has risen to great importance and perfection.

The commercial spirit dates back to a very early period. At first the woollen was the only branch of trade, but since the middle of the last century the cotton business has nearly superseded the former fabric. The series of brilliant inventions and discoveries, applied, improved, or originated in the district of Manchester, which comprise the steam-engine, the spinning-jenny, the mule-jenny, the fly-frame, the tube-frame, the mule, &c., have proved most effective instruments in aiding the development of the cotton manufactures. Several hundred millions of pounds of cotton are brought into Manchester from Liverpool every year; and the cotton factories are by far the most important buildings in the town: there are more than two hundred of them within the precincts of the town and parish. Some of

them are only spinning factories; others are both spinning and weaving. Bleach-works, dye-works, and print-works, all connected with the cotton manufacture, exist on a large scale in and near Manchester.

The processes of throwing and weaving silk were extensively carried on at Macclesfield several years before they reached Manchester. The silk-mill of Mr. Vernon Royle, erected in 1819–20, was the first brought into operation in the latter town. Since then the trade has rapidly increased. Printing is another branch of the silk business, chiefly, if not exclusively, carried on at Manchester. Dyeing of silk is also extensively pursued, and in fact the town is becoming the centre of transactions in the silk trade.

The warehouses of Manchester are on a vast scale; they contain not only the woven products of the town's factories, but the produce of most of the other cotton towns is brought to Manchester, as a central exchange for the manufacturer and the dealer. It was calculated, in 1837, that 700,000 tons of goods were carried by canal alone from Manchester to the south, yearly; besides that which passed north, east, and west, and besides the railway goods' traffic; and in 1849 the amount is vastly greater.

The Collegiate Church is a noble Gothic building. Since Manchester has been made a bishopric, this church has become a cathedral. In the High Street of Salford, a magnificent Roman Catholic cathedral has recently been constructed: there are several Roman Catholic chapels in Manchester. The churches of this town belonging to the establishment are numerous; but few of them are remarkable for their architecture. Trinity Church at Salford is next in age to the cathedral. The new churches in the four suburbs of Cheetham, Platt, Birch, and Longsight are among the best. Dissenting places of worship are very numerous.

The Manchester Free Grammar School was founded by Hugh Oldham, bishop of Exeter, in 1515: its income is large, but the education given is scarcely adequate to its resources. When Henry VIII. dismantled the college which had been founded at Manchester by Henry VI., the church of the college was left standing, and now constitutes the cathedral; and the college buildings, after passing from hand to hand, and being appropriated to various uses, were purchased by Humphrey Cheetham in 1665, and opened as Cheetham's hospital or college. This college is a sort of free-school for a small number of boys: an excellent public library is attached to it.

The Deaf and Dumb School, the Blind School, the Infant Schools, the National Schools, the Lyceums, the Mechanics' Institution, are for the most part remarkable rather for their usefulness than their architectural beauty. The Athenæum and the Royal Institution, devoted to literary and scientific objects, are fine buildings. So likewise are the new Independent College and the Wesleyan Theological Institution. Manchester is rich in societies—such as the Natural History Society, the School of Design, the Geological Society, the Architectural Society, the Medical Society, and above all the Literary and Philosophical Society.

The charitable institutions of Manchester have in few cases much external beauty. The chief among them is the Royal Infirmary and Dispensary, which has attached to it a Lunatic Asylum. The House of Recovery, the Salford Dispensary, the Chalton Dispensary, the Ardwick Dispensary, and several other charities of a similar kind, present the usual features of such establishments.

The municipal and commercial buildings are very numerous. There are three town-halls, for Manchester, Salford, and Chalton; and there are three work-houses belonging to the same three divisions. The New Bailey Prison at Salford is among the largest of the municipal buildings. The Mercantile Exchange, situated in Market Street, is said to be the largest exchange room in Europe. The Corn Exchange is a fine building. The Free-Trade Hall is remarkable rather for its size than its beauty. There are two or three fine club-houses in Mosley Street and King Street.

In 1846 the inhabitants of Manchester greatly improved their town by the formation of three public parks, called Queen's Park, Peel Park, and Phillips' Park, and situated in the three townships of Salford, Bradford, and Harpurhey. Munificent subscriptions were made for this purpose, and the parks are in every way a credit to the town. Victoria Park, southward of Manchester, is an open green spot with villas around it. Botanical and Zoological gardens have been laid out in the vicinity of the town. There are several cemeteries in the outskirts of Manchester.

MANCHINEEL TREE. [HIPPOMANE.]

MANDA'MUS is a writ by which the Court of King's Bench, in the name of the reigning king or queen, commands the party to whom it is addressed to do some act in the performance of which the prosecutor, or person who applies for or sues out the writ, has a legal interest, that is, not merely such an interest as would be recognised in a court of equity or in a court of ecclesiastical jurisdiction, but an interest cognizable in a court of common law; the right must also be one for the enforcing of which the prosecutor has no other specific legal remedy. Thus, a copyholder can transfer or alien his customary tenement or estate in no other manner than by surrendering it into the hands of the lord of the manor to the use of the purchaser or surrenderee. The courts of common law formerly took no notice of the right of the surrenderee to call upon the lord for a grant or admittance, and the Court of King's Bench therefore left the party to seek his remedy in a court of equity, and would not interfere by granting a mandamus. But the obligation on the part of the lord to admit the surrenderee is not merely an equitable liability, because this mode of transferring property of this nature is founded upon ancient custom, and rights dependent upon custom are matters of common-law cognizance. Of late years the Court of King's Bench appears to have taken this view of the subject, and has awarded writs of mandamus in all cases where the lord has refused to admit the party to whose use a surrender of the copyhold has been made.

The term 'mandamus' (we command) is found

in a great variety of writs, and those usually distinguished by this name by the old law writers are totally different from the modern writ of mandamus, which appears to be nothing more than the ancient 'writ of restitution' enlarged to embrace a great variety of objects, that writ being adapted merely to the purpose of restoring a party to an office from which he has been unjustly removed.

The writ of mandamus is now granted not only to restore a man to an office from which he has been wrongfully amoved, but also to admit to an office to which he has been duly elected or appointed.

In order to obtain a mandamus, the applicant lays before the court the affidavit of himself or of others, presenting the facts upon which his right and interest in the thing to be done, and his claim or title to the remedy are founded. Upon this application, the court can grant a rule calling upon the party against whom the writ is prayed to show cause why such writ should not be awarded. At the appointed time the party so called upon either does not appear, in which case the rule is made absolute, and the mandamus is awarded as prayed, or he appears and resists the rule, either by insisting upon the insufficiency of the facts disclosed by the affidavits upon which the rule was obtained, or by producing other affidavits which give a different aspect to the transaction. If the resistance be effectual, the rule is discharged; if not, the mandamus is awarded.

The writ in the first instance issues in an alternative form, requiring the party to do the act, or to show why he has not done it. The party may make a return to the writ by saying that he has not done the act required for such and such reasons. Where the reasons returned are insufficient in law, the court quashes the return, and awards a peremptory mandamus requiring the party absolutely, and without allowing him any alternative, to do the act. Where the answer is apparently sufficient, the mandamus is at an end; and, if the statements are untrue, the remedy is by action on the case for a false return, though in order to avoid expense and delay the party is allowed, in some cases, by the Statute 9 Anne, c. 20, and now in all cases, by 1 Wm. IV. c. 21, to engraft an action upon the mandamus itself by traversing the return, that is, by putting in a plea contradicting the allegations contained in such return.

(Comyn's *Digest;* Selwyn's *Nisi Prius;* Tapping, *On Mandamus;* 1 Vict. c. 78.)

MANDAN is a name which in recent times has been given to a portion of the territory of the United States of North America, bounded N. by the British possessions, W. by the Rocky Mountains, E. by Wisconsin, and S. by the Indian Territory. It extends about 500 miles from N. to S., and about 600 miles from E. to W., and comprehends an area of about 300,000 square miles. It includes the sources of the Missouri and the Yellow Stone River, with their numerous branches, and is chiefly an elevated table-land, consisting of extensive prairies, on which large herds of the bison, elk, and deer find abundant subsistence. This region has yet been little explored. It has been thus named from the Mandan Indians, who were nearly all destroyed by the small-pox in 1837, and the remainder of whom have since intermixed with other tribes.

MANDARINS is the general name of the officers of state in China. They are chosen from the men of letters or scholars from every part of the empire. In Duhalde's time there were 13,600 mandarins all over the empire, independent of the military mandarins. The civil mandarins are divided into nine classes, the highest of which are ministers of state, counsellors of the emperor, or presidents of the supreme courts. Each order has its distinctive mark of dignity; the highest orders wear a peacock's feather at the back of their caps. There is a regular gradation and strict subordination among them.

MANDATE, one of the contracts of the Roman law, was constituted when one by agreement, or by tacit assent, undertook to perform some act gratuitously for another. It is distinguished from Negotiorum Gestio, in which the person who performs the service undertakes it without authority from the person for whom it is undertaken; and from Locatio Conductio, where the service is remunerated. The characteristics of Mandatum are briefly stated by Gaius, iii. 155, &c. In England mandate in this simple sense is a department of the law of Bailment. In Scotland, almost every instance where one person acts for another is said to be under the contract of mandate; thus the commercial agent buying and selling, and the solicitor conducting a litigation, are said to be 'Mandatories.' The case in which, by the practice of the law of Scotland, the word mandate in its old sense is best exemplified, is in trusts, which, instead of being subject to the complex legal peculiarities which characterise the system in England, are merely treated as simple mandates. The acceptor of a bill is held to be a mandatary of the drawer.

MANDAVEE. [HINDUSTAN.]

MANDEVILLE, SIR JOHN DE, was born at St. Albans, about the year 1300. He studied mathematics, theology, and medicine, and for some years pursued the last as a profession. In 1327 he went to Palestine, where he joined the army of the infidels. He afterwards served in Egypt under the sultan, and in Southern China under the Khan of Cathay. He resided for three years at Peking, and appears to have travelled over a large part of Asia. After an absence of about thirty-three years, he returned to England, and wrote a narrative of his travels, which he dedicated to Edward III. He died Nov. 17, 1372, at Liège, where he was buried.

MANDEVILLE, BERNARD DE, was born at Dort, in Holland, about 1670. He took the degree of Doctor of Medicine in Holland, and afterwards practised his profession in London. He does not appear to have had much success as a physician. His first work, 'The Virgin Unmasked, or Female Dialogues betwixt an elderly maiden Lady and her Niece,' was published in 1709. In 1714 he published a short poem, called 'The Grumbling Hive, or Knaves turned Honest,' to which he afterwards added long ex-

planatory notes, and then published the whole under the new title of 'The Fable of the Bees.' This work, which however erroneous may be its views of morals and of society, bears all the marks of an honest and sincere inquiry on an important subject, exposed its author to much obloquy. He wrote some other works which were also attacked. He died Jan. 21, 1733, in his sixty-third year.

MANDINGOES. [SENEGAMBIA.]

MANDOLINE, a musical instrument of the lute kind, but smaller, having four strings, which are tuned in the same manner as those of the violin. The mandoline is still met with occasionally in Italy, but has fallen into disuse in most other parts of Europe.

MANDRAGORA, MANDRAKE. [ATROPA.]

MANDRILL. [BABOON.]

MANDSHOORIA now constitutes a government of the Chinese empire under the name of Kirin-oola, or Ghirin-oola. It is the most eastern projection of the high lands of Central Asia, and lies between 42° and 58° N. lat., and between 120° and 142° E. long. Its surface is estimated at about 700,000 square miles. On the N. it borders on Siberia, W. on Mongolia, E. on Corea, and S. on the Chinese provinces of Pe-cheli and Leao-tong.

Mandshooria may be considered as an immense valley inclosed by high and steep mountains, except at its south-western corner, where a broken and rather hilly tract divides it from the province of Leao-tong. Some of the mountain-ranges reach a height of 5000 feet, and one summit is 15,000 feet. The interior of Mandshooria contains, towards its southern extremity, an extensive and nearly level plain, called Cortchin. It lies on both sides of the Siren-Muren, or Leao-Ho, and seems to stretch northward to the banks of the rivers Nonni-oola and Songari. The remainder of Mandshooria is supposed to consist of a succession of valleys and mountain-ranges of various elevation. The mountains however are not bare, but covered with forests nearly to the top. The valleys are said to be fertile.

The principal river is the Amur, which has numerous tributaries. Through the southern districts runs the Sira-Muren or Leao-Ho, which flows about 500 miles.

The forests yield various kinds of timber trees. The inhabitants cultivate grain and many useful plants. Wild animals and domestic animals are numerous.

The population is very vaguely estimated at two millions, but it is probably much underrated. All the people, with the exception of the Mongols, who inhabit Cortchin, belong to the race of the Tungooses, of whom the nation named Mandshoo form a portion. The most widely spread tribe is the Proper Tungooses.

MANES, the name given by the Romans to souls separated from the body. The etymology of the word is uncertain; it is generally derived, by ancient grammarians, from an old word, *manus*, signifying 'good,' probably in the same sense as the Furies were called Eumenides by the Greeks.

The stones in the Roman burial-places, and their funeral urns, were generally inscribed with the letters D.M.S., that is, *Dis Manibus Sacrum*, 'Sacred to the Manes Gods.' There are many specimens of such funeral inscriptions in the Townley Gallery, British Museum.

MA'NETHO, an Egyptian writer, a native of Diόspolis, who is said to have lived in the time of Ptolemæus Philadelphus at Mende or Heliόpolis, and to have been a man of great learning. He was a priest, and interpreter or recorder of religious usages and of the religious and probably also historical writings. It is supposed that there was more than one person of the name of Manetho.

The only work of Manetho which has come down to us complete is a poem, in six books, in hexameter verse, on the influence of the stars (ἀποτελεσματικά), which was first published by Gronovius, Leyden, 1698, and has also been edited by Axtius and Rigler, Cologne, 1832. There are considerable fragments of a work of Manetho on the history of the ancient kings of Egypt, which was probably written by the Manetho who lived under Ptolemæus Philadelphus. It comprised the period from the earliest times to the death of the last Persian Darius. Considerable fragments are preserved in the treatise of Josephus against Apion; and still greater portions in the 'Chronicles' of George Syncellus, a monk of the ninth century. Manetho derived his history of the kings of Egypt, whom he divides into 30 classes, called dynasties, from the sacred records in the temple at Heliopolis.

MANFRE'DI, natural son of the Emperor Frederic II., was appointed by his father, at his death, A.D. 1250, regent of the kingdom of the Two Sicilies, until the arrival of his brother Conrad, the legitimate son and heir of Frederic. Upon the death of Conrad, and the reported death of Corradino, his son, Manfred was invited to assume the crown, which he retained by general consent, even after it was discovered that Corradino was still alive. But Manfred had to contend against the See of Rome, by the authority of which he was excommunicated. Urban IV. treated Manfred as an usurper, bestowed the crown upon Charles, Count of Anjou, brother of Louis IX. of France. Charles marched an army into the dominions of Manfred, who was killed under the walls of Benevento, while making a gallant resistance in February 1266. Manfred was fond of letters, was himself a poet, and is praised by the Neapolitan chroniclers for his great and noble qualities.

MANFREDONIA. [CAPITANATA.]

MANGALORE. [CANARA; HINDUSTAN.]

MANGANESE, a metal first discovered by Scheele and Gahn, about 1775. Its natural compounds are very numerous, and the metal is easily separated from them. Manganese has a grayish white colour, and resembles white cast iron in appearance; it is hard, brittle, and has a fasciculated crystalline structure; its specific gravity, according to Berthier, is 7.05; it is inodorous and tasteless, but when breathed upon emits a smell of hydrogen gas. By exposure to the air, manganese readily tarnishes by oxidisement, and even

in a very short time attracts sufficient oxygen to lose its metallic lustre, and falls to a reddish brown powder; hence the necessity for preserving it immersed in naphtha. Even at common temperatures it slowly decomposes water; and at a red heat the decomposition is rapidly effected, and in both cases hydrogen gas is evolved, and oxide of manganese formed.

The ores of manganese are chiefly oxides. The principal among them are *Haussmannite*, *Braunite*, *Manganite*, *Varvicite*, *Pyrolucite*, *Black Wad*, or *Hydrated Binoxide of Manganese*, *Psilomelane*, *Kobellite*, or *Manganese Blende*, *Arseniuret of Manganese*, *Cupreous Manganese*, *Kohlerite*, or *Carbonate of Manganese*, *Silicate of Manganese*, *Knebelite*, or *Silicate of Manganese* and *Iron*, *Ullmannite*, or *Phosphate of Manganese* and *Iron*. Many of these are crystalline; the rest massive.

Oxygen and *Manganese* combine in 5 proportions. The *protoxide* ($O^1\ M^1$) is of a light green colour. It undergoes no change by exposure to the air. It is insoluble in water. When heated to 600°, it acquires oxygen, and is converted into red oxide; and sometimes, by exposure to a strong heat, it undergoes combustion as well as oxidation. It combines readily with acids, and dissolves in them, even when dilute and cold, without effervescence; and the solutions are colourless. It is this oxide which is the base of all the common salts of manganese. The *red oxide* ($O^4\ M^3$) suffers no change by exposure to the air, is insoluble in water, and has a reddish colour. The nitric, sulphuric, and hydrochloric acids all decompose it, the two first separating it into protoxide and binoxide; and they dissolve the first and leave the second insoluble. The *sesquioxide* ($O^3\ M^2$) is brown, except when obtained from the nitrate, and then it is nearly black. It is insoluble in water, suffers no change by exposure to the air, is decomposed by dilute nitric and sulphuric acids, being separated by them into protoxide, which they dissolve, and peroxide, which remains insoluble. The *peroxide* ($O^2\ M^1$) is black, or brownish black, unalterable in the air, insoluble in water, decomposed by heat into red oxide and oxygen gas, insoluble in alkalis, unacted upon by nitric acid or dilute sulphuric. There is a fifth oxide ($O^7\ M^4$) forming the mineral *varvicite*.

There are two acids of manganese which are entirely artificial compounds, namely, the manganic acid and per-, or, more properly, the hyper-manganic acid. *Manganic acid* has not hitherto been obtained in a separate state; but manganate of potash is easily prepared. It is of a green colour, and has long been known by the name of *mineral chameleon*, on account of the change of colour which the solution undergoes during the process. *Hypermanganic acid* has a fine red colour, and is rapidly decomposed by organic matter, as paper or linen. It bleaches coloured matter; the aqueous solution begins to decompose when heated to 86°, and is totally decomposed at 212°; oxygen is given out, and binoxide of manganese is precipitated. Its salts are more permanent than the acid, and when heated they yield oxygen gas, deflagrate when thrown on burning charcoal, and detonate violently with phosphorus. Manganic acid consists of $O^3\ M^1$, and hypermanganic acid of $O^7\ M^2$.

Chlorine and *Manganese* form two compounds. The *protochloride* ($Chl.^1\ M^1$) is a pink-coloured lamellated mass, which attracts moisture readily from the air, and is very soluble in water, forming a solution which is nearly or quite colourless. The *perchloride* ($Chl.^7\ M^2$) is a greenish-coloured vapour, which, by cooling to 4°, condenses into a greenish brown-coloured fluid. *Sulphur* and *Manganese* may be combined by heating a mixture of sulphur and the binoxide, from which results a *sulphuret* ($S^1\ M^1$).

According to Berzelius, manganese combines with several other metals, as gold, silver, copper, tin, and iron; with the last-mentioned, combination takes place readily, and the iron is rendered harder, whiter, and more brittle by it; and it is stated that iron which contains manganese is best adapted for making steel. A small quantity of iron causes manganese to obey the magnet, and renders it less oxidable.

The salts of manganese are compounds of very little importance.

Oxide of manganese tinges glass of an amethystine colour.

The oxides of manganese, and especially the binoxide, as containing most oxygen, are largely employed in the preparation of chlorine, for the manufacture of bleaching powder, or chloride of lime. It is employed in glass-making to correct the yellow colour which oxide of iron is apt to impart to the glass; it is used also in making the black enamel of pottery. Sulphate of manganese has also been used within a few years to give a brown colour in calico-printing.

Action of Manganese on the Body.—The extensive employment of black oxide of manganese in the preparation of bleaching powder produces in some of the workmen a form of paralysis which should be early noticed, inasmuch as, after it is thoroughly established, it seems altogether incurable, and the only chance of escape is the complete abandoning of the occupation. It is limited to paralysis of the lower extremities, affecting the motor nerves only, for the sensibility is unimpaired.

Binoxide of manganese has been used internally in pills, and also as a gargle; externally as an ointment in some obstinate cutaneous affections. It does not appear entitled to much attention. Hydrochlorate, and still more sulphate of manganese, deserve attention as chologogue cathartics, or promoters of the secretion of bile. The latter salt has a cooling and bitter taste, resembling that of Glauber salt. It is useful in gout.

MANGE, an eruptive disease to which many domestic animals, and particularly dogs, are subject. It usually occurs as the result of dirt and confinement, bad or deficient food, or some other circumstances producing a generally unhealthy condition.

MANGEL WURZEL. [BETA; BEET.]

MANGI'FERA, a genus of trees of the natural family of *Terebinthaceæ*, tribe *Anacardiæ*. Three or four species of this genus are enumerated: as

M. fœtida of Loureiro, a native of Cochin-China and the Moluccas; *M. laxiflora*, indigenous in Mauritius; and *M. sylvatica*, of Roxburgh, a native of the hilly districts bordering on Silhet, where it grows to a great size. The Mango Tree however, *Mangifera Indica*, is alone of any consequence, and this as forming one of the most grateful fruits of the tropical parts of Asia. The trees grow to a great size, with an erect trunk and dark-coloured cracked bark. The wood is of a whitish or a dull gray colour, porous, yet pretty durable if kept dry.

MANGLE. [Calendering.]

MANGO. [Mangifera.]

MANGOSTANA. [Garcinia.]

MANGROVE. [Rhizophora.]

MANHEIM, or MANNHEIM, the capital of the circle of Unter-Rhein, in the grand-duchy of Baden, is situated in 49° 29′ N. lat., 8° 28′ E. long., in a very fertile plain, at the junction of the Neckar with the Rhine, and has 22,000 inhabitants. Over both rivers there are bridges of boats. Manheim is built with great regularity; it consists of several squares and of broad straight streets that cross each other at right angles. The houses are all of two stories, except those at the corners, which have three stories. The principal street leads from the Neckar Gate to the palace of the grand-duke, which is a very magnificent building, and one of the finest of the kind in Germany. The right wing contains a gallery of pictures, a cabinet of natural history, a collection of plaster casts of the most celebrated antiques, and a library of 60,000 volumes. Among the other public buildings the most worthy of notice are the observatory, the merchant's hall, and the splendid church formerly belonging to the Jesuits, the theatre, three hospitals, &c. Manheim has a gymnasium, a botanic garden, a mercantile school, an academy of painting and sculpture, and other establishments for education. The fortifications having been entirely demolished by the French, and the site subsequently converted into gardens, the inhabitants enjoy the benefit of beautiful promenades, besides the fine park of the palace, which is nearly 200 acres in extent. The town has a considerable transit trade. There are manufactories of tobacco, shawls, linen, and playing cards, besides bleaching-grounds and tanneries. In the environs there are numerous gardens, and hops are extensively cultivated. Manheim has communication with the great trunk railway on the right bank of the Rhine, by a branch line 19¼ miles in length, which joins the former at Heidelberg.

MANICHÆANS, an heretical Christian sect, who derived their name from Mani, as he is called by the Persians and Arabians, or Manes or Manichæus, according to the Greek and Roman writers. This sect arose about the end of the third century, or the beginning of the fourth century A.D. The Manichæans believed, like the Magi, in two eternal principles, from which all things proceed, namely light and darkness, which are respectively subject to the dominion of two beings, one the god of good, and the other the god of evil; and also that those souls which obeyed the laws delivered by Christ, as explained by himself the Comforter, and struggled against the lusts of a corrupt nature, would, on their death, be delivered from their sinful bodies, and ascend to the regions of light; but that those souls which neglected to struggle against their corrupt natures would pass after death into the bodies of animals or other beings, until they had expiated their guilt. The doctrines of the sect were contained in four works, said to have been written by Mani himself, which were entitled respectively 'Mysteries,' 'Chapters,' 'Gospel,' and 'Treasury;' but we know little or nothing of their contents.

The Manichæans never appear to have been very numerous, but they were spread over almost all parts of the Christian world. Much valuable information concerning this sect may be found in the writings of Augustine, who was for nine years a zealous supporter of the Manichæan doctrines.

The Paulicians are generally considered to be a branch of the Manichæan sect, and are supposed to have appeared first in the seventh century in Armenia. They continued to exist till a very late period in ecclesiastical history. In the 11th and 12th centuries the doctrines of the Paulicians were introduced into Italy and France, with considerable success.

MANIFOLD WRITER. [Copying Machine.]

MANI'LIUS, MARCUS or CAIUS, a Latin poet, who wrote a work on astronomy, called 'Astronomicon,' in five books. It is the opinion of Bentley that he was born in Asia, and lived in the time of Augustus Cæsar.

The 'Astronomicon' does not appear to be complete. The five books which are extant treat principally of the fixed stars; but the poet promises in many parts of his work to give an account of the planets. The 'Astronomicon' contains several passages which are not unworthy to be compared with some of the best writings of the Augustan age; but the subject gave the author little opportunity for the exercise of his poetical powers. The best editions are by Bentley, London, 1739, and Stoeber, 1767. It has been translated into English verse by Creech, London, 1700.

MANILLA. [Philippines.]

MANIPULATION, in chemistry, embraces every part of the subject which is of a mechanical nature, such as the operations of weighing, measuring, the application of heat and electricity, the various modes of effecting solution, precipitation, distillation, and sublimation, and in fact every step in chemical research includes manipulation. The whole subject is treated in Faraday's 'Chemical Manipulation.'

MA'NLII, the name of one of the most illustrious patrician *gentes* of ancient Rome. Those most worthy of notice are:—

1. *Marcus Manlius Capitolinus*, who was consul B.C. 390 (Liv., v. 31), and was the means of preserving the capitol when it was nearly taken by the Gauls (Liv., v. 47), from which he obtained the surname of Capitolinus. He afterwards became a warm supporter of the popular party against his own order, in consequence of which he was accused of aiming at the kingly power. The circumstances attending his trial and death are involved in much obscurity. It would appear

that he was accused before the centuries and was acquitted; and that afterwards, seeing that the patrician party were determined on his destruction, he seized upon the capitol, and prepared to defend it by arms. In consequence of this Camillus, his personal enemy, was appointed dictator, and the curiæ (*i. e.* the patrician assembly) condemned him to death. (Niebuhr, 'Roman History,' vol. ii. p. 610, 611, Engl. transl.; Liv., vi. 11, 14, 20.) Manlius was put to death B.C. 381.

2. *Titus Manlius Capitolinus Torquatus*, son of L. Manlius, surnamed Imperiosus, who was dictator B.C. 361. In the following year Manlius distinguished himself by slaying in single combat a Gaul of gigantic size on the banks of the Anio. In consequence of his taking a chain (*torques*) from the dead body of his enemy, he received his surname of Torquatus. (Liv., vii. 10.)

Manlius filled the office of dictator twice, and he was consul at least three times. In his third consulship he defeated the Latins. In the same campaign he put his own son to death for having engaged in single combat with one of the enemy, contrary to his orders. (Liv., viii. 5–12.)

3. *Titus Manlius Torquatus* was consul B.C. 235, and obtained a triumph on account of his conquests in Sardinia. In his second consulship, B.C. 224, he conquered the Gauls. The temple of Janus was closed during the first consulship of Manlius. (Liv., i. 19; Vell., ii. 38.)

4. *Cneius Manlius Vulso* was consul B.C. 189, and appointed to the command of the war against the Gauls in Galatia, whom he entirely subdued. An account of this war is given by Livy (xxxviii. 12–17), and Polybius (xxii. 16–22).

MANNA, the concrete juice of the *Ornus Europæa*, a species of ash which is a native of the south of Europe, growing abundantly in Sicily, Calabria, Apulia, &c. The juice exudes spontaneously in warm dry weather, and concretes upon the bark of the tree; the finest manna is however procured by making longitudinal incisions of about three inches long. The manna flows at first in the form of a thick juice, which gradually concretes. The finest kind is called Calabrian or flake manna; it is in pieces of a pale yellowish white colour, is light, rather dry, and brittle, and it bears frequently the impression of the branch on which it concretes. It has a slight peculiar odour, and a sweetish taste, mixed with a slight degree of bitterness, and altogether leaves a disagreeable impression. Although it has a composition not unlike sugar it is not fermentable.

Manna is employed as a gentle laxative, for children or persons of weak habits. It is however seldom exhibited alone, but as an adjunct to more active medicines, as senna, rhubarb, &c.

Besides the genuine manna above described, other sweetish secretions are exuded by some other plants which are usually considered to be kinds of manna. These appear to be all produced in warm and dry parts of the world, and are the produce of various species of plants. Manna belongs to the same series of vegetable bodies as sugar, and like that compound is widely distributed in the vegetable kingdom.

MANNINGTREE. [ESSEX.]

MANNYNG, ROBERT, is more usually called Robert de Brunne. He owes this name to his having been a Gilbertine canon in the monastery of Brunne or Bourne in Lincolnshire. He lived in the reigns of Edward I. and his successor, and was the writer of one of the earliest of the Metrical Chronicles whose language can be called English. His work however is merely a translation from the French. It is in two parts: the first translated from the 'Brut d'Angleterre' and 'Roman le Rou' of Wace and Gaimer, begins with Æneas and ends with Cadwallader; the second, from Cadwallader to Edward I., is translated from the Chronicle of Peter Langtoft. Robert's version was published by Hearne in 1725.

MANOR (*Manerium*). At the time of the Norman conquest manerius or manerium (from *manere*, to dwell) denoted a large mansion or dwelling. The modern English manor derives its origin from subinfeudation, as it existed before the modifications of the system of tenures introduced in 1225 by Magna Charta, and the still more important alterations made in 1290 by the statute 'Quia Emptores,' and in 1324 by the statute 'De Prærogativâ Regis,' by which statutes the granting land in fee simple, to be held by the grantee as a tenant or vassal to the grantor, was stopped.

Where a subinfeudation made by A to B extended to the whole of A's land, nothing remained in A but a seigniory with the ordinary feudal incidents of tenure, and such rents or other services as were reserved. This interest in A was a seigniory in gross, that is, a seigniory held by itself, unattached to any land, an incorporeal seigniory, termed by the French feudists 'un fief *en l'air*.' But in the case of subinfeudation of part of the land, the ordinary mode of proceeding was this:—A, a large proprietor, having a mansion and land at Dale, created a subtenure in a portion of his land by granting such portion to B and his heirs, to hold of A and his heirs, as of A's manerium (mansion) of Dale, which words created an implied condition that B should perform the service of attending, with the other tenants of A holding by virtue of similar subinfeudations, at A's halmote of Dale, that is, at A's court-meeting in the hall of A's mansion at Dale (afterwards called A's court-baron of his manor of Dale), for the purpose of deciding judicially all disputes among A's free tenants holding of him by the same tenure as B, in respect of their lands so holden, and also all actions brought by persons claiming such lands.

Upon this subinfeudation being effected, A would continue to be the owner of the mansion of Dale, and of that part of the land of Dale of which he had made no subinfeudation, in demesne (in dominico suo), as his own immediate property; and he would have the seigniory of lands of which B and others had been subinfeoffed, as a seigniory appendant or legally annexed to the mansion of Dale, and to the demesnes of Dale, of which the mansion formed part.

This conjoint or complex estate, taking its de-

nomination from the mansion (manerium), which was considered as its head, by degrees acquired the name of Manerium or Manor.

A Manor then *originally* consisted of lands in demesne, upon which the lord had a mansion, and to which lands and mansion, and more especially to the mansion, there was appendant a seigniory over freeholders qualified in respect of quantity of estate (*i. e.* by a tenancy for life at the least, if not a tenancy in fee-simple), and sufficient in point of number to constitute a court-baron. These freeholders were called vavasors, and their lands 'tenemental lands,' *i. e.* lands granted out in tenure, to distinguish them from the lord's demesnes. These tenemental lands, anciently known by the denomination of vavasories, though held of the manor and within the seigniory (or, as it was usually termed, within the fee) of the lord, were not considered as part of the manor; but the services issuing from such tenemental lands were part of the manor and essential to its existence.

Afterwards it was sufficient if the site of a mansion, at which the services had been reserved, formed part of the demesnes; and, at last, this vestige of the origin of the name of the estate was dispensed with, and if the lord retained any portion of the land, so that there would be some demesnes to which the seigniory over the freehold tenants of the manor, and the services rendered by them, might continue to be appendant, the compound estate called a manor was not dissolved, whether it could be shown that a mansion had ever stood on the part of the demesnes or lands retained or not, and even if the lord had aliened and severed from his demesnes the spot on which the mansion had once stood.

A Manor is commonly said to consist of demesnes and services, which have been called the 'material causes;' but other things may also be members and parcel of a manor. Further information on Manors is contained in the article Manor in the 'Penny Cyclopædia.'

Manors in Ancient Demesne are those manors which, though now mostly in the hands of subjects, formed part of the royal domain at the time of the Conquest, and are designated in Domesday as 'terra regis.'

MANOSQUE. [Alpes, Basses.]

MANRESA. [Cataluña.]

MANS, LE, the capital formerly of the province of Maine, now of the department of Sarthe in France, stands on the right bank of the Sarthe, here crossed by three bridges, in 48° 0′ N. lat., 0° 11′ E. long., at a distance of 115 miles S.W. from Paris, and has 25,189 inhabitants. The old part of the town which is situated near the river is ill-built, with narrow, crooked, dirty streets, running parallel to each other, and connected by still narrower and dirtier lanes. The new quarter stands on a hill, and although not regularly laid out, it is on the whole agreeable and well built, with cut-stone houses roofed with slates. The principal streets of this quarter abut on a fine square called Place-des-Halles. There are two fine promenades, one called Des-Jacobins, the other Du-Greffier; this last runs along the Sarthe, the banks of which are lined with quays. The cathedral of St.-Julien, famous for its choir and painted windows, and dating from the 13th century, contains the tomb of Berengaria, Cœur-de-Lion's queen. The church De-la-Couture, which dates from the 12th century, and that of Notre-Dame-du-Pré, from the 11th century, are very remarkable buildings. The church De-l'Ancienne-Visitation, opened in 1737, is also a beautiful structure. The other objects of notice in the town are the prefect's hotel, which contains a public library of 40,000 volumes, a museum, &c.; the theatre; the theological and communal colleges; the corn-market buildings; and several ancient houses, among which are shown those of Queen Berengaria and Scarron.

Le-Mans gives title to a bishop; it has tribunals of first instance and of commerce, and several learned and benevolent societies. The manufactures consist of coarse woollens, lace, linen, soap, hosiery, blankets, woollen yarn, paper, and leather. There are also marble works and bleach-mills. The articles enumerated, together with iron, salt, rags, wine, brandy, chestnuts, corn, oil, cattle, sheep, pigs, poultry, and clover-seed, support a considerable commerce.

Le-Mans was the birth-place of Henry II., the first of the Plantagenet kings of England.

(*Dictionnaire de la France.*)

MANSARD, FRANÇOIS, was born at Paris in 1598. At the age of twenty-two he began to distinguish himself as an architect by his restoration of the Hôtel Toulouse; and a short time afterwards he was commissioned to execute the portal of the church of the Feuillans, in the Rue St. Honoré. From this time he was much employed. The Château des Maisons is considered his *chef-d'œuvre* among his mansions, and of his churches the most noted is that of the Val de Grace at Paris, but none of his works are in a pure style of architecture. He died in 1666. He is said to have been the inventor of the curb roof, called after him, a *Mansard*, which consists of two planes on each side, a steeper one below and a flatter one above.

MANSARD, JULES HARDOUIN, nephew of the preceding, was born in 1648. He was brought up by François to his own profession, in which he afterwards became the more celebrated of the two. He was the architect of Versailles, which Sir C. Wren has described as 'heaps of littleness.' After Versailles, the work which has chiefly contributed to his reputation is the dome of the Invalids at Paris. He died in 1708. His somewhat partial biographer, Quatremère de Quincy, admits that he had 'une certaine médiocrité de goût.'

MANSFIELD. [Nottinghamshire.]

MANSFIELD, WILLIAM MURRAY, EARL OF, was born at Perth on the 2nd of March, 1704, o. s. He was the fourth son of Andrew Viscount Stormont. At the age of three he was removed to London, and in 1719 he was admitted a king's scholar at Westminster school. On the 18th of June, 1723, he was entered at Christ Church, Oxford, where, as before at Westminster, he distinguished himself by his classical attain-

ments. After taking his degree of M.A. he left the university in 1730, and after travelling some time abroad he was called to the bar in Michaelmas Term, 1731. It appears that he got into some practice soon after being called to the bar. In 1743 he was appointed solicitor-general, and obtained a seat in the House of Commons, where his eloquence and legal knowledge soon rendered him very powerful. Murray and Pitt (Lord Chatham) were opposed to each other as the best speakers of their respective parties.

In 1754 Mr. Murray was made attorney-general, and in 1756 he received the appointment of chief-justice of the King's Bench, and was immediately created a peer, by the title of Baron Mansfield, of Mansfield in the county of Nottingham. On his elevation to the seat of chief-justice, Lord Mansfield, contrary to the general usage, became a member of the Cabinet.

In the riots of 1780 Lord Mansfield's house in Bloomsbury Square was attacked and set fire to by the populace. The walls were all that were left of it. His library of books and MSS., his private papers, pictures, furniture, and other valuables were all consumed. Though the treasury, in pursuance of a vote of the House of Commons, applied for the particulars and amount of his loss, with a view to compensation, his lordship declined returning any account of his loss, lest, he said in his letter to the Treasury, 'it might seem a claim or expectation of being indemnified.'

After having presided for upwards of thirty years in the Court of King's Bench, he retired in 1788. He died on the 20th of March, 1793, in the 89th year of his age. He left no issue. The earldom of Mansfield, which was granted to him in 1776, descended to his nephew, Viscount Stormont.

Lord Mansfield's acute and powerful intellect enabled him to take a clear and comprehensive view of every case. The depth of his legal learning has been questioned; probably not without reason. He showed the greatest ability in improving by his judicial decisions various branches of commercial law. In matters of religion he was tolerant both in parliament and on the bench. He was undoubtedly a man of great abilities and enlarged views, and for this very reason less adapted than some judges to expound those parts of English law which are overloaded with technicalities, which mark the deviation of English law from the standard of general jurisprudence.

MANSLAUGHTER. [MURDER.]

MANTEGNA, ANDREA, was born at Padua, in 1431. His parents were in humble life. He was a pupil of Francesco Squaricone. His chief residence and his school were at Mantua, where he settled under the patronage of the Marquis Lodovico Gonzaga, but worked occasionally at other places, especially Rome. 'The Triumph of Julius Cæsar,' was purchased by King Charles I. from the Gonzaga family among other pictures. This, the greatest and most esteemed work of Mantegna, consisting of nine pictures, each 9 feet high and 9 feet wide, is now at Hampton Court. Unhappily it was coarsely painted over by Laguerre, in the time of William III. Mantegna died in 1505.

MANTES. [SEINE-ET-OISE.]

MAN'TIDÆ, a family of orthopterous insects, the principal genera of which are, *Heteronytarsus*, *Eremiaphila*, and *Mantis*.

The Mantidæ are found in all warm countries, are exceedingly numerous, and remarkable for the grotesque forms which they usually assume. Their resemblance to a portion of a plant is often so great, that it is only by their motions they can be discovered. The names *religiosa*, *precaria*, *sancta*, &c., have been applied to certain species on account of a peculiarity in their habits—that of erecting the thorax at an angle with the body, and placing together the large fore-legs, like the hands of a person when at prayer; in this position they will sometimes remain perfectly motionless for several hours. Their food consists of flies and other insects, which they are exceedingly dexterous in catching by means of their fore-legs; the prey is held by the fore-leg by bending back the tibia against the femur; the opposing surfaces of these two portions of the legs being covered with spines, enables them to retain their prey in this manner, and to convey it to the mouth.

The eggs are deposited by the female *Mantis* upon plants, and are covered by a glutinous substance, which soon becomes hard and forms a kind of case, in which they are arranged in a symmetrical manner. The form of the case varies according to the species. The young, when hatched, resemble the parents, except in size and in being destitute of wings.

MANTINEIA was situated in the east part of Arcadia, in an elevated plain of considerable extent, which was bounded on the north by the plain of Orchómenus, and on the south by that of Tégea. The Mantineans had a democratical form of government, and were closely connected with Argos.

In B.C. 385, the Spartans took Mantineia and destroyed the city. After the battle of Leuctra, the Mantineans rebuilt their city; and it was in the vicinity of their town that the battle was fought, B.C. 362, between the Spartans and Thebans, in which Epaminondas fell. Mantineia, in later times, joined the Achæan league. Pausanias, who visited this city in the second century, describes it as a large and flourishing place, and has devoted a considerable part of his eighth book to a description of its works of art.

The ruins of Mantineia, now called *Palæopoli*, are still considerable. The walls are nearly entire.

MA'NTOVA, a province of Austrian Italy, is bounded E. by Verona and Rovigo, N. by Brescia and the lake of Garda, W. by Brescia and Cremona, and S. by the duchies of Modena and Parma. The province of Mantova extends along both banks of the Po. The other rivers are the Mincio and the Oglio, both affluents of the Po. The Mincio issues out of the lake of Garda at Peschiera, and for about ten miles marks the limits between Verona and Mantova, after which it flows across the territory of the latter, forms the lagune in the midst of which stands the city

of Mantua, and then enters the Po below Governolo. The length of the province from N. to S. is about 36 miles, and its breadth about 32 miles: the population is about 260,000. The territory of Mantova is noted for its fertility. It contains numerous fine meadows well adapted for the grazing of cattle, and irrigated by numerous streams and canals; vines and mulberry-trees also abound. Landed property is very valuable in this district, which labours however under two disadvantages, namely, the danger of the inundations of the Po, to prevent which the dykes and sluices are kept in constant repair at a great expense, and the unwholesomeness of the air in summer. There is no town of any importance except the capital.

MA'NTOVA (or MANTUA), the Town of, stands on an island about five miles in circumference, in the middle of a lagune formed by the Mincio, and is joined to the mainland by causeways, the shortest of which is about 1000 feet in length. The town is regularly fortified. It is well built, with wide streets and squares, and contains many handsome structures. The principal buildings are—the cathedral, one of the finest in Italy; the church of Sant-Andrea; the churches of San-Maurizio and San-Sebastiano; the house of Giulio Romano, whose works as a painter and an architect form the greatest glory of the city; the church of Santa-Barbara, rich in paintings; the public library of 80,000 volumes, and the museum, in which is a valuable sculpture gallery; the ducal palace, an old vast irregular structure, partly rebuilt by Giulio Romano, which contains some good paintings; and the gates and bridges of Mantua, especially the gate dei Mulini, by Giulio Romano. A palace outside of the town, called Palazzo del Tè, was originally intended for stables for the dukes Gonzaga, but under the direction of Giulio Romano it grew into a vast palace. The town of Mantua contains about 25,000 inhabitants, 3000 of whom are Jews. It is a bishop's see, and has a lyceum and a gymnasium.

MANTUA. [MANTOVA.]

MANTUA'NO, the common name of a family of artists of Mantua, of the sixteenth century. The proper name appears to have been *Ghisi*, but few particulars regarding the lives of its members are known. *Giovanni Battista*, called *Giovanni Mantuano*, and also Bertano, was painter, sculptor, engraver, and architect. He wrote a commentary on Vitruvius, which is dated 1558. *Giorgio Ghisi*, called *Giorgio Mantuano*, was born at Mantua about 1520. He was a painter and an engraver, and was still living in 1578. Bartsch describes 129 prints by *Adamo Ghisi*, called also *Mantuano;* and 46 by *Diana Ghisi*, called *Mantuana*. Those of the former are dated from 1566 to 1576, and those of Diana from 1575 to 1588.

MANU (a word which implies 'rational,' from *man* to 'understand'), according to a Hindoo fiction, was the son or grandson of the creating deity Brahmâ, the first of rational beings, and the progenitor of mankind, who thence are called Mânavâs, or Manujâs (offspring of Manu). To this primeval sage, the father of the human race, and their patriarchal ruler and legislator, is ascribed a system of religious and civil law, which was revealed to him by Brahmâ, and has been handed down by tradition to the present age. In other words, the Sanskrit work now extant, and indiscriminately called Smriti (tradition), or Mânavadharmasâstra (the institutes of Manu), is deemed by the Hindus not only the oldest but at the same time the holiest text after the Vedas. The work is divided into the twelve following chapters—i., On the creation; ii., On education, or on the first order; iii., On marriage, or on the second order; iv., On economics and private morals; v., On diet, purification, and women; vi., On devotion, or on the third and fourth orders; vii., On government, or on the military class; viii., On judicature, and on law, private and criminal; ix., On the commercial and servile classes; x., On the mixed classes, and on time of distress; xi., On penance and expiation; xii., On transmigration and final beatitude.

The most striking feature of this code is the rigour and purity of its morals. A complete system of ethics might be gathered from the scattered moral sentences, such as the following: Let not a man be querulous, even though in pain; let him not injure another in deed or in thought, let him not even utter a word by which his fellow-creature may suffer uneasiness (2, 161).—Even here below an unjust man attains no felicity, nor he whose wealth proceeds from giving false evidence; for the soul itself is its own witness: offend not thy soul, the supreme internal witness of men. The sinful have said in their hearts, 'No one sees us.' Yes, the gods distinctly see them, and so does the spirit within their breasts (4, 170; 8, 84).—He who perseveres in good actions, in subduing his passions, in bestowing gifts, in gentleness of manners, who bears hardships patiently, who associates not with the malignant, who gives pain to no sentient being, obtains final beatitude (4, 246; 12, 10). The principal moral duties in general are summed up in the following passage: 'The avoiding of all injury to animated beings, veracity, the abstaining from theft and from unjust seizure of property, cleanliness, and command over the bodily organs' (10, 63).

The time at which the laws of Manu were composed is uncertain, and it was only from conjecture that Sir William Jones fixed the twelfth century B.C. as the probable epoch of their composition. It is the code of an already refined and enlightened people, and the work bears ample testimony that a very advanced degree of civilisation had been acquired by the Hindoos when these laws were promulgated.

The 'Institutes' of Hindoo law, or the 'Ordinances of Manu,' were verbally translated from the original by Sir William Jones, 1794. The Sanskrit text with the gloss of Kullûkabhatta was published at Calcutta in 1813, and a new edition of the metrical text, together with Sir William Jones's translation, carefully collated with the original, was prepared by Sir Graves Haughton, 1822, 1825. Another valuable edition, with

select notes and a French interpretation, by Loiseleur des Longchamps, was published at Strasburg in 1830.

MANUAL ALPHABET. [DACTYLOLOGY.]

MANUEL, NICOLAS, was born at Bern, in 1484. He is the Emanuelo Tedesco who studied under Titian at Venice about 1511, and he became celebrated for a series of pictures (probably in distemper) of the Dance of Death, *Todtentanz*, painted in fresco between 1514 and 1522, in the cloister of the Dominican convent at Bern, destroyed long since, but of which the compositions have been preserved in prints and copies. He also produced various popular poems and songs in the Swiss dialect, full of humour and satire. His 'Fastnachtspiele,' or Dramatic Moralities and Mysteries, which he began to compose about 1522, are marked by the same qualities. He died in 1530. An elaborate memoir of him was published in 1837 by Dr. Grüneisen.

MANUEL, FRANCISCO, was born at Lisbon in 1734. His first study was music, but he afterwards devoted himself entirely to literature, and more especially to poetry. His liberal opinions brought upon him the hostility of the Inquisition, but he saved himself by flying to Paris, in 1788; in which city he resided till Feb. 25, 1819, when he died. He excelled in lyric and satiric poetry, and among his productions of the former class his odes to D'Albuquerque and Washington are deservedly admired.

MANUMISSION. [LIBERTINUS.]

MANURE. Every substance which has been used to improve the natural soil, or to restore to it the fertility which is diminished by the crops annually carried away, has been included in the name of manure. There are some substances which evidently belong to both classes of manure. Of these *lime*, either in its caustic state of quick lime, or its milder form of a carbonate or chalk, is the principal. Lime, being an earth less porous than sand, and more so than clay, has an improving effect on soils in which either sand or clay prevails; but it has also a chemical effect as an alkaline earth.

Lime as a manure acts most powerfully in its caustic state, that is, when deprived of the carbonic acid which is generally united with it. It readily unites with the half-decomposed fibres of vegetable matter, such as straw, heath, and the like; it helps their decomposition and accelerates it; by its means the dead fibres of the roots of vegetables, which remain in the earth when the plant is removed, become soluble; and their elements, entering into new combinations, supply the materials for the various vegetable substances which are naturally produced. As long as there is a store of organic matter or humus in the soil, lime will be an excellent manure; it combines with certain elements of decayed animal and vegetable matter, and forms a compound which is soluble in water, and which attracts carbonic acid and moisture from the atmosphere. This compound is readily taken up into the sap by the fibres of the roots, and supplies the plant with oxygen, hydrogen, and carbon. But lime, besides its effect on the humus in the soil, acts also on the clay which it may contain; and where this is abundant its effect is most beneficial.

Wherever there is peaty matter in the soil, which, owing to the tannin principle which it contains, is, by itself, perfectly incapable of putrefaction, lime is the true remedy. Assisted by fæculent matter to produce a degree of heat and fermentation in it, lime soon dissolves peat, and converts it into real humus, than which there is no better food for vegetation. In a very stiff clay, chalk or lime will render it much more porous, and admit the influence of the atmosphere; it will correct acidity and assist the nutritious effects of animal and vegetable manures. On poor sands chalk will be found to produce a greater and more permanent improvement than the same value in lime.

The first and most important class of manures are the excrements of animals. From the most ancient times of which there are any records, the dunging of a field has been an important part of cultivation. The preparing of the dung of animals, so as to render it more efficacious, is a later improvement, which however has not yet attained the perfection of which it is capable. The fresh dung dropped on the ground, far from improving the herbage where it has fallen, appears to injure it, and render it unfit for cattle to eat; when it gradually disappears, and not till then, the spot is restored to its former verdure. But if the dung is dug into the ground and covered with earth, the fertilising effect will be immediately perceived. This is a sufficient lesson to the husbandman to make him bury the dung as soon as possible. But this not being always practicable, it is collected in heaps until it can be carried to the land prepared for its reception by ploughing or digging. By mixing the straw, which has served as litter to cattle, with their dung, the quantity is increased, and by allowing this mixture to heat and putrefy, a greater quantity of manure is produced. The proper management of a dunghill is an important feature in farming. Cow-dung, when in a fresh state, is thought best for light soils, and horse-dung for cold heavy soils. The richer the dung, from the nature of the food given to the animals, the less of it need be used. A mixture of the dung of all the different animals kept on a farm, with all the straw that can be afforded, will give a manure of an average strength, which may be used upon all kinds of land. It is better to manure slightly and often than to put on a large quantity at once, except for some particular crops. The chief use of cattle on an arable farm, besides those which are necessary for the operations of husbandry, is to produce manure for the land. If the cattle repay their food and the expense and risk attending their keep, the manure is sufficient profit. Even with a moderate loss, they must be kept, when manure cannot be purchased. Manure is to a farm what daily food is to an animal; it must be procured at any sacrifice.

Various means have been adopted to increase the quantity and efficacy of manure. The simplest is, to increase the number of cattle, and husband their manure. In all countries where

stall-feeding is practised, the lands are highly manured, and the crops more certain and abundant.

The great use of liquid manure on light soils is to impregnate them with soluble matter, which, being diffused through their substance, supplies nourishment to the roots of plants, wherever they may shoot out. It may be applied to the land at any time before the seed is sown, and soon after, when the blade springs up or the seed begins to form. The great effect of liquid manure has set farmers on finding some artificial substitute for the simple urine and diluted dung of cattle. Such substitutes are obtained by mixing all kinds of refuse animal matter (such as the refuse from oil mills and other manufactories) with water, and inducing putrefaction. This becomes a branch of trade in those countries where nothing will grow without manure.

The increase of manure by the formation of *composts* is well known in many parts of Britain, and by their means the land has in many districts been rendered much more productive. The fundamental principle upon which composts have been made, is that of impregnating portions of earth with those parts of the dung of cattle, which, from want of management in the common dunghills, would have been dissipated and lost; and also accelerating or retarding the decomposition of animal and vegetable substances by the addition of earths, such as chalk, marl, clay, and even sand, according to the nature of the soil on which the compost is to be used. Composts and liquid manures have each their sphere of usefulness, according to the age and species of the plant, and the kind of soil. In the formation of composts the principal objects are, to regulate the decomposition of the organic substances, and to increase the bulk of the manure by means of less expensive materials than straw. For these purposes lime or chalk is generally used; but the stiffest clay may be used with advantage in composts, where better soil is not at hand. The most useful material, under proper management, is peat or turf. This may be laid in layers with quicklime and earth; the whole being well soaked with liquid manure. If any kind of vegetable matter, such as fern, broom, the tops of heath, or pond weeds, can be added, it will be so much the richer.

As a substitute for urine, several mixtures of animal and saline matters have been tried, which are supposed to resemble it in composition.

Bones have been treated of in a separate article [Bones]; and another very important animal manure is noticed under Guano.

The various substances which are generally enumerated as occasionally used for manure, are chiefly the refuse of manufactures, consisting of earths, salts, and organic substances. Soapers' waste is chiefly lime with a small portion of alkali. The scrapings of leather, horn, bones, and the refuse of the shambles, the hair or wool of animals, and rags made of these, may be all classed together. They must be distinguished as acting in a twofold manner: they absorb and retain moisture, at the same time that they afford nourishment by their gradual decomposition.

There is one substance which has been highly extolled as a manure. This is called *urate*, being a compound of urine and plaster of Paris. It is formed by mixing sand and burnt gypsum with urine, and forming a hard compound, which is afterwards reduced to powder. Its action on the growth of many plants appears to be very valuable.

The ashes of vegetable substances which have been burnt in the open air contain a great portion of potash, with some fine earths. They are consequently very effective in stimulating vegetation on lands which contain a good portion of humus. They are chiefly used as a top-dressing on young clovers and grasses; and whenever there is an appearance of sourness in the grass wood-ashes are of great use. The refuse ashes from bleachers' and soap-boilers' premises have still some portion of alkali in them, and as they contain lime and other earths in a very divided state, their effect on the soil is very perceptible. Common salt has been extolled and decried at different times, owing probably to the different circumstances under which it has been tried. In a very small quantity sea-salt may have a beneficial effect on the soil.

MANURING, in Horticulture, requires to be considered in a somewhat different light from that process as applied to agricultural purposes. The gardener is called upon to cultivate species from almost every kind of soil on the surface of the globe. It is therefore obvious that considerable caution is requisite in applying manure and in determining the quantity and quality.

The kind of manure chiefly used, and frequently the only kind procurable by the gardener, is that derived from the farm-yard, consisting chiefly of the dung of horses or of horned cattle, more or less mixed with litter. Formerly it was very generally the custom to take advantage of the heat resulting from the fermentation of such dung in hot-bed forcing, and there are still some objects for which this kind is found preferable. [Hot-Bed.] Other substances which are or may be successfully applied to promote the growth of vegetation are exceedingly numerous; and although it would be impossible to particularize them, they may nevertheless be made sufficiently known by stating that they consist of—

1. All animal substances without exception.
2. The excrementitious secretions of all animals.
3. All kinds of vegetable substances in one state or another.
4. A few mineral substances, of which one or the principal is lime.

Animal substances are very powerful manures and require to be attenuated or diluted before plants can derive nourishment from them, or in fact before either roots or tops can be safely brought within their contact. Blood, blubber, oil, and bones, are all employed occasionally, in more or less prepared state. Gardeners often use crushed and fermented bones for forcing strawberries, and, reduced to dust, as a top-dressing for lawns.

The liquid portions of excrementitious manures require either to be diluted with water or to receive an admixture of soil before they are brought in contact with the roots of plants. In the case of trees with roots lying deep in the ground, such

dilution is not always necessary; but generally speaking adherence to the rule is advisable.

Manures derived from the vegetable kingdom require little preparation if they consist of such plants as are chiefly parenchymatous, such as the brassica tribe; their substance is easily soluble, and they may therefore be turned fresh into the soil. The period of their growth when this is most beneficially performed is before they run to seed. Weeds may even be used with great advantage if properly prepared; but they require much precaution. Yeast is a powerful vegetable manure, especially if employed in a state of putrefaction; but it requires to be diluted with water till it appears of the colour of very small beer. Applied in that state it has extraordinary power in stimulating the growth of annual crops of all kinds; but its effects are by no means permanent; for lawns however it is a restorative manure of great value. The same may be said of malt-dust.

Of mineral manures lime is the most useful. It is not recommended for soils that contain a large proportion of soluble vegetable matter; but it produces excellent effects in such as abound in inert vegetable fibre. Gypsum is a good manure for lawns.

Common salt is sometimes employed in minute portions, especially in combination with vegetable matter, in the instance of sea-weeds, in which case it is found of good quality for fruit-trees and kitchen-garden crops; but vegetable life is certainly destroyed by it, if applied in any considerable quantity. The application of dung and lime, of composts of clay, marl, scourings of ditches, &c., will render peat permanently fertile; more especially when draining is judiciously attended to. There are some plants to which manure is prejudicial. Coniferous species of all kinds are affected most injuriously by it, and it requires to be given very sparingly to all trees which yield gum in their bark, especially stone-fruits, such as cherries, plums, peaches, and nectarines. To many it appears to be useless; orchidaceous plants, for instance, which are now cultivated so extensively, seem insensible to its application in any form yet adopted.

MANU'ZIO, ALDO, born in 1447, at Bassiano in the Papal State, studied at Rome and at Ferrara. He became intimate with Pico, Count of Mirandola, and with Alberto Pio, Lord of Carpi, with whose assistance he established a printing-press at Venice. Aldo Manuzio surpassed all other printers of his time in the correctness of his books. Being a man of learning as well as a printer, and having an extraordinary zeal for his profession, he procured the most correct MSS., and he established an academy in his house, with the view of obtaining assistance in the superintendence of his publications. Bembo and Navagero were among the members of that society. The first publications of Aldo appeared about 1490; the first with a date in 1494. He invented a new sort of type, which was light and resembled writing, called by the Italians 'corsivi,' and known to other nations by the name of 'Italic.' In this type he printed the Latin classics. A complete catalogue of the works of Aldus has been published at Paris by Renouard, the last edition of which is 1834. He was the author of a Latin and Greek Grammar, a Greek and Latin Dictionary (the first of its kind), and several other works. His son Paolo Manuzio succeeded him in the direction of his printing establishment. Paolo was a man of learning, an author, and a critic.

MANZANARES. [CASTILLA-LA-NUEVA.]

MAP (in Latin, *mappa*, a napkin; in French, *mappemonde*, a map of the world.)

A map is the representation of the surface of a sphere, or a portion of a sphere on a plane. The name however is commonly applied to those plane drawings which represent the form, extent, position, and other particulars of the various countries of the earth.

Maps, being plane representations of the surface of a sphere, may be obviously applied to various purposes; hence we not only have terrestrial maps to represent the surface of the earth, but celestial or astronomical maps to represent the sphere of the heavens; and these general distinctions have again their subdivisions.

There are two kinds of terrestrial maps—geographic or land maps, and hydrographic or sea maps: the latter are usually called charts.

The methods adopted in the construction of maps are as various as the taste and judgment of geographers themselves, but they may all be referred to two principles, viz. *Projection* and *Development*.

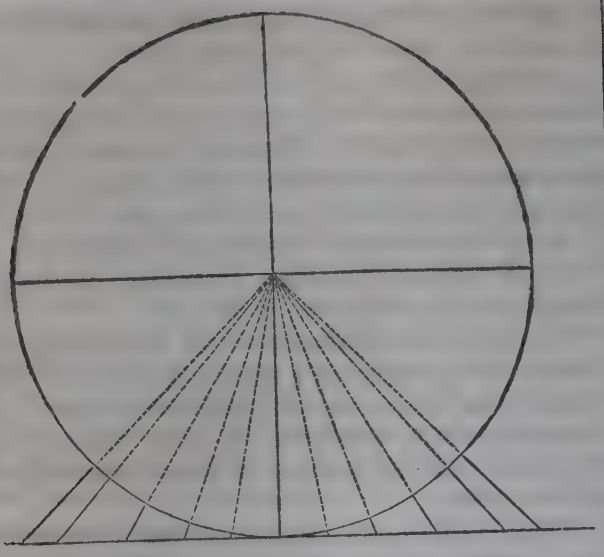
By *Projection* is meant the representation of the surface of a sphere on a plane, according to the laws of perspective. By *Development* is to be understood the unfolding or spreading out of the spherical surface on a plane. This however first supposes the sphere to be converted into a cone or a cylinder—these being the forms, portions of which most resemble portions of a sphere, and which, at the same time, are susceptible of the required development.

There are four methods of spheric projection in general use, the *Gnomonic* or *Central*, the *Orthographic*, the *Stereographic*, and the *Globular*, distinguished from each other by the different positions of the projecting point in which the eye is supposed to be placed.

Projection.

The *Gnomonic* or *Central Projection* supposes the eye to be placed in the centre of the sphere, and that the various objects to be delineated are transferred from a sphere to a plane, which is a tangent to its surface. The entire hemisphere can never be represented by this projection, since the circumference which terminates it is on a level with the eye, and is therefore parallel to the plane of projection. This method is chiefly used in dialling, but may be advantageously applied to maps of a limited extent, more especially if they are maps of the polar regions of the globe. In this case the meridians will be straight lines radiating from the centre, and the parallels of latitude concentric circles, whose distances from the centre will respectively be equal to the cotangents of their latitudes.

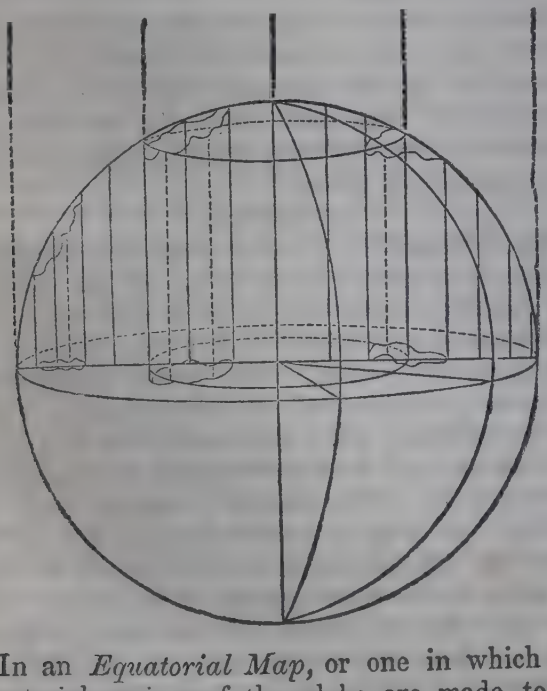
In the other cases of this projection, where the perspective plane is parallel to the horizon, or to



any meridian, the construction is rendered troublesome on account of the parallels of latitude becoming curves of difficult delineation: these cases therefore are seldom brought into use.

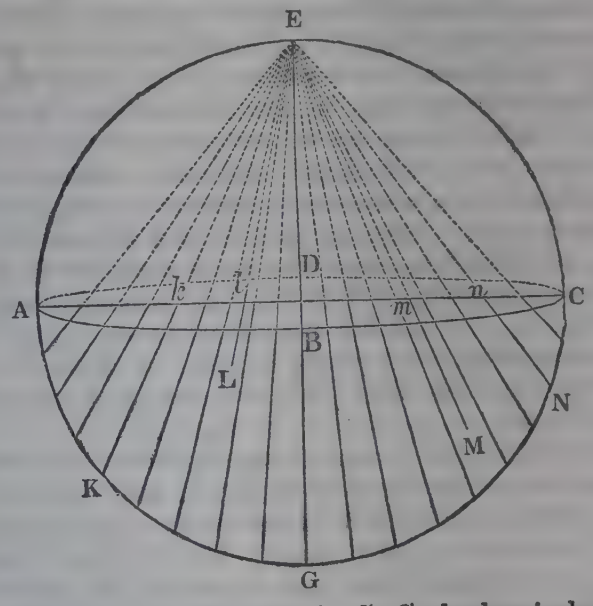
Orthographic Projection.—In this projection the eye is supposed to be at an infinite distance, so that the visual rays leave the sphere in parallel lines. The perspective plane on which a hemisphere is supposed to be delineated is the plane of that diameter which is perpendicular to the visual rays—hence every point of the hemisphere is transferred to this plane by perpendiculars let fall upon it. It will be immediately seen from the figure, that the representation will decrease in accuracy with the increase of distance from the centre; the parts near the circumference being much foreshortened and distorted.

In a *Polar Map* of this projection, the meridians, as in the Gnomonic maps, will be radii, and the parallels concentric circles; these circles however will have their distance from the centre equal to the cosines, and not to the cotangents of their respective latitudes.



In an *Equatorial Map*, or one in which the equatorial regions of the globe are made to occupy the centre of the map, the plane of projection coincides with the plane of one of the meridians. In this case the latitude circles will be projected in straight lines parallel to the equator, which is also a straight line, and will vary in distance from it according to the sines of their respective latitudes. The meridians will be portions of ellipses intersecting the equator in points similar in position to the intersecting points of the parallels on the polar diameter, and having their transverse axes coincident with this diameter and equal to it.

Stereographic Projection.—In this projection the eye is supposed to be placed at the surface of the sphere, and to view the concave of the opposite hemisphere through the plane of that circle, in the pole of which the eye is placed.



If E be the eye, and A, G, C, the hemisphere to be represented, A, B, C, D, will be the plane of projection; and the position on this plane of any point of the spherical surface will be indicated by a line drawn from that point through the plane to the eye. Thus the points K, L, M, N, on the sphere will be transferred to the plane at *k*, *l*, *m*, *n*.

The advantages offered by this method of projection have brought it more into use than the methods before mentioned. It is especially calculated for maps of the world, as usually made in two hemispheres, from the circumstance of the representation being less distorted, and also on account of the meridians and parallels intersecting each other at right angles, as they do on the globe. Its construction also is less difficult than others, since all the great circles of the sphere are either circles or straight lines in the projection. The meridian of 20° W. is the one usually selected by English geographers for the plane of projection in these maps of the world, because this meridian passes very nearly between the eastern and western continents, which therefore occupy their respective hemispheres.

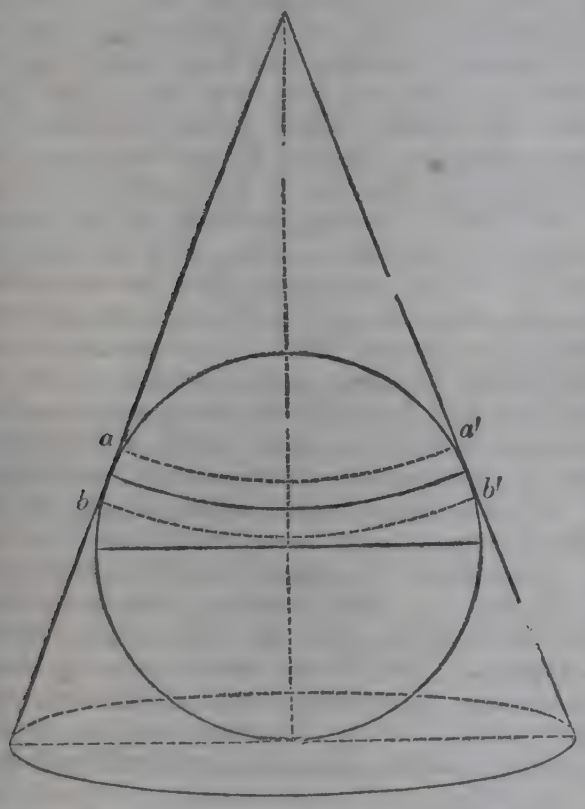
Globular Projection.—This projection, which is a modification of the Stereographic, was invented by the astronomer De Lahire, who supposed the eye to be placed at a distance from the sphere equal to the sine of 45°; that is, if the diameter of the sphere be equal to 200, the distance of the eye from the nearest point of the circumference would be $70\frac{7}{10}$. Some modification was subsequently deemed desirable, in order that the meridians might intersect the equator at equal distances. This condition is nearly fulfilled when the distance of the eye is $59\frac{1}{2}$, the diameter being 200.

This projection is also much used in maps of the world, but, to simplify their construction, the meridians and parallels are projected into circular instead of elliptical arcs, the deviation from the strict law of the projection being too slight to affect the practical utility of the map.

Projection by Development.

The developments to be mentioned are two—the *Conical* and *Cylindrical.*

Conical Projection.—In this projection the sphere is supposed to be circumscribed by a cone, which touches the sphere at the circle intended to represent the middle parallel of the map. If the points on the sphere be now projected on the cone, by lines drawn from the centre, it is clear that in a zone extending but a short distance on each side the middle parallel, as the zone *a a' b b'*, the points on the cone would very nearly coincide in position with the corresponding ones on the sphere. All the delineations having been thus made, the cone is then conceived to be unrolled or developed on a plane surface.



Should the map be made to extend much above or below the middle parallel, the distant parts will be very much distorted. To remedy the defects of this projection, various modifications have been suggested, among which those of Flamsteed are generally held in the highest estimation.

Cylindrical Projection.—From what has been said of the cone, it will be easily understood that a cylinder may be applied to the sphere in a similar manner, and that a zone of very limited extent in latitude may, without very material error, be developed on a cylinder. The peculiarity of this method is, that the meridians, as well as the latitude circles, are projected in parallel straight lines; a condition of the map which makes it very applicable to nautical purposes, and on which (partly) is founded the very ingenious method called *Mercator's Projection*, which is now so universally adopted in our charts, and to which, in conclusion, we will briefly allude.

Mercator's Projection.—The line on which a ship sails, when directing her course obliquely to the meridian, is on the globe a spiral, since it cuts all the meridians through which it passes at equal angles. This circumstance, combined with others, rendered a map constructed on the principles of the spherical projections very inadequate to the wants of the navigator. Mercator considered, very justly, that mariners do not employ maps to know the true figures of countries, so much as to determine the course they shall steer, and the bearing and distance of those points or places which lie near their track; and this projection is the result of his efforts to secure to the seamen these desirable ends. The merit of this most useful method is thought by many to be more justly due to Wright; for, although Mercator published his first chart in 1556, he omitted to declare the principles on which he proceeded, and his degrees of latitude did not preserve a just proportion in their increase towards the poles. Wright, in 1599, corrected these errors, and explained the principles of his improved construction, in which the degrees of latitude on the chart were made to increase towards the poles, in the same ratio as they decrease on the globe; by which means the course which a ship steers by the mariner's compass becomes on the chart a straight line; the various regions of the map, however distorted, preserve their true relative bearing, and the distances between them can be accurately measured.

MAPLE. [ACER.]

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MARACAIBO. [VENEZUELA.]

MARANHÃO, SAN LUIZ DO, a town on the northern coast of Brazil, stands on the north-western coast of the island of Maranhao, in 2° 30′ 40″ S. lat., and 43° 50′ W. long., and has 28,000 inhabitants. The island is separated from the continent by the shallow channel of Rio do-Mosquito, which is only one hundred yards wide, and terminates in two large bays, the Bahia de San-Jozé on the east, and the Bahia de San-Marcos on the west. The town is divided into two sections. The more ancient and populous part, called Bairro da Praia Grande, extends along the shore on a broken surface. The streets are crooked, uneven, and badly paved; some of them are not paved at all. The houses have two or three floors, and are mostly built of sandstone. In this part of the town is a large square, surrounded by the palace of the governor, the college of the Jesuits, the town-hall, and the prisons, which are substantial buildings. At the back of this section lies the other, called Bairro de Nossa-Senhora-da-Conceiçao, which consists of small houses, many of which are surrounded by gardens and plantations. Each division has its own parochial church, besides which there are three other churches, two chapels, and four churches belonging to four convents. The harbour is good and safe, but the entrance is difficult. The tide rises 18 feet in the harbour. The inhabitants are chiefly engaged in

commerce: only the most common articles of domestic use are made in the town; the rest are imported from Europe. The imports consist of wine, brandy, oil, flour, fruits, silk, cotton and linen goods, hardware and metals, spices, drugs, &c. The exports are cotton, rice, tanned and raw hides, &c.

MARAÑON. [AMAZON.]

MARANS. [CHARENTE INFE'RIEURE.]

MARANTA'CEÆ, a natural order of endogenous plants, distinguished by a single stamen, whose anther has only one lobe. With the exception of the genus *Calathea*, and of *Canna*, which is commonly cultivated under the name of Indian Shot, because of its beautiful flowers, the species included in this order are of small size, and by no means attractive, but the fleshy tubers of some of them abound in starchy matter, which renders them nutritious. All the species are found wild in tropical countries only.

Maranta arundinacea is generally referred to as the plant from which the Arrow-Root of commerce is obtained, but it is also procured in large quantities from a variety of closely allied plants. Thus the Surinam and Bermuda arrow-root is the produce of the *M. arundinacea*, while the Jamaica arrow-root is obtained from the *M. indica*, which plant, along with several Curcumas, yields also the East Indian arrow-root. The West Indian arrow-root has mostly a pure white colour, the East Indian a yellow tinge.

The tubers, root-stocks, or offsets, are grated or bruised, and repeatedly washed with water, which is passed through a fine hair-sieve, so long as it runs off with a milky appearance. It is allowed to subside, the supernatant water drained off, and the powder dried. Arrow-root consists essentially of starch, and potato-starch is frequently used to adulterate it, or as a substitute for it. The grains of the different kinds of arrow-root starch may be distinguished from those of the potato by their form under the microscope.

Arrow-root dissolved in water, milk, or any other appropriate vehicle, constitutes, from its easy digestibility, a most excellent article of diet for delicate persons and young children. It may be given plain, or with wine or spices, according to circumstances. Potato-starch may be prepared at a very cheap rate, but is not so easy of digestion as arrow-root.

MARASMUS (Emaciation) is a term often used by the older medical writers to designate those cases in which no particular cause for the atrophy of the body was discovered.

MARA'T, JEAN PAUL, born near Neuchâtel, in 1744, studied medicine at Paris. At the commencement of the Revolution in 1789, he showed himself a furious demagogue.

Marat was elected a member of the Convention. He was the declared enemy of the Girondins, and he saw the downfall of that party, but did not long survive it. On July 13, 1793, he was stabbed to the heart while taking a bath, by a young woman from Normandy, named Charlotte Corday. [CORDAY.]

MARATEA. [BASILICATA.]

MA'RATHON, a small plain in the north-east part of Attica, about five miles in length and two in breadth, which is chiefly memorable for the victory which the Athenians under Miltiades gained over the Persians here, B.C. 490. The Athenians who fell in the battle were buried in the plain; and also, but apart from the Athenians, the Platæans, Bœotians, and slaves. A large tumulus of earth still rises from the centre of the plain; and near the sea there are two others, much lower than the former.

MARATTI, CARLO, was born at Camurano, in the March of Ancona, in the year 1625. He was a highly esteemed painter of the Roman school. He painted for Louis XIV. his celebrated picture of 'Daphne.' Fuseli considers his 'Bath-sheba viewed by David,' his greatest work. He died at Rome in 1713.

MARAZION. [CORNWALL.]

MARBECK, JOHN, composer of the solemn and now venerable notes set to the Preces and Responses, which are still in use, with some alterations, in all our cathedrals, was organist of Windsor during the reigns of Henry VIII. and his successor. He was in danger of being burnt for heretical writings, but lived to witness the triumph of his principles, and to publish 'The Boke of Common Praier, noted,' and the first concordance in English of the Old and New Testaments. The date of his death is unknown.

MARBLE. A strict definition of this term is perhaps impracticable, unless, with Da Costa, we limit it to the calcareous rocks, 'of very lively colours, and of a constitution so fine that they will readily take a good polish.' A limestone which will admit of being worked equally in all directions, and is capable of taking a good polish deserves the title of marble; when it is granular and of a white colour, it may be useful in statuary.

The following are brief notices of some of the best known and most useful marbles:—

Division I. Marbles of One Plain Colour.

Section 1. Black marbles. Most of these contain bitumen, and are fetid when bruised. Examples. The Namur marble, the marble of Ashford in Derbyshire, Dent in Yorkshire, near Crickhowell, Tenby, Kilkenny, &c.; the marble anciently called Marmor Luculleum, and now Nero Antico.

Section 2. White marbles. Examples. The marble of Paros; the Carrara marble, of fine grain, much used in modern sculpture; the Skye marble, that of Inverary, Assynt, Blair Athol, &c.

Section 3. Ash and gray marbles. Example. A beautiful marble, of compact oolitic texture at Orleton, near the Clee Hills in Shropshire.

Section 4. Brown and red marbles. Examples. The Rosso Antico; a marble on the estate of the Duke of Devonshire, near Buxton. The mottled brown marble of Betham Fell, near Milnthorp, of good quality.

Section 5. Yellow marbles. Examples. The Giallo Antico; Siena marble. That used in ancient Rome is said to have been from Numidia.

Section 6. Blue marbles. Example near St. Pons in Languedoc.

Section 7. Green marbles. Example. The

Marmor Lacedæmonicum of Pliny. It is dug near Verona.

Division II. Marbles of Two Colours.

Section 1. Black marbles variegated with other colours. Examples. Near Ashburton and Torbay, in Devonshire; Bianco e Nero Antico, the African Breccia of the ancients; Giallo e Nero Antico.

Section 2. White marbles variegated with other colours. Example. Marble imported from Italy. Marbles of this general character occur at Plymouth, at Killarney, in Sweden, &c.

Section 3. Ash and gray marbles variegated with other colours. These are very numerous, and occur in various parts of Europe.

Section 4. Brown and red marbles variegated with other colours.

Section 5. Yellow marbles variegated with other colours.

Section 6. Green marbles variegated with other colours. Examples. Egyptian marbles—the Marmor Tiberium and Augustum of Pliny; some Verde Antico, as that dug near Susa in Piedmont; the beautiful marble of Anglesey (called Mona marble).

Division III. Marbles variegated with Many Colours.

Examples. Some of the Plymouth marble; the beautiful Brocatello or Brocade marble of Italy and Spain.

Marbles containing Shells, Corals, and other extraneous Bodies.

In this division of marbles the British Islands are rich. Some of the Plymouth, Ashburton, and other Devonian limestones are extremely beautiful, from the abundance of fine corals exquisitely preserved in them; the crinoidal marbles of Flintshire, Derbyshire, and Garsdale in Yorkshire, are elegant examples of the carboniferous limestone; the shell marbles of Buckingham, Whichwood Forest, Stamford, Yeovil, may be noticed, from the oolitic rocks. That of Petworth and Purbeck, from the Wealden strata, has been extensively used by the architects of the middle ages.

MARBLEHEAD. [MASSACHUSETTS.]

MARBURG, the capital of the province of Upper Hesse, in the electorate of Hesse-Cassel, is situated in 50° 50′ N. lat., 8° 47′ E. long., on the Lahn, which divides the town from the suburb of Weidenhausen. The town, which is partly surrounded with a wall pierced by five gates, has a university, with a library of 100,000 volumes, an anatomical theatre, a chemical laboratory, a botanical garden, &c. The population amounts to about 7520.

MARCA D'ANCO'NA, an old denomination of a geographical division of the Papal State, the limits of which nearly correspond with those of ancient Picenum, and which is now subdivided into the three provinces of Ancona, Fermo-ed-Ascoli, and Macerata-e-Camerino. It has been called La Marca, 'the March,' since the time of the Carlovingian emperors and kings of Italy, from being governed by marchiones or marquises. *March* meant originally a frontier district, but the term was afterwards applied rather capriciously. Cesare Borgia subdued the country, and it became from his time annexed to the papal territories. It was then generally called Marca d'Ancona, from its principal town; but the south-east part of it was also sometimes called Marco di Fermo, and the two together were often designated Le Marche or the Marches.

MARCELLIN, ST. [ISE'RE.]

MARCELLINUS. [AMMIANUS MARCELLINUS.]

MARCELLI'NUS was bishop of Rome in the reign of the emperor Diocletian. He died A.D. 304.

MARCELLO, BENEDETTO, a patrician of Venice, son of Agostino Marcello, a senator, was born in 1686. He studied music under Gasparini and Lotti, and in 1716 a serenata from his pen on the birth of the first son of the Emperor Charles VI. was performed at Vienna. His great work, published in 8 vols. folio, in 1724 and 1726, was 'Estro Poetico-Armonico, Parafrasi sopra i 50 primi Salmi, Poesia di G. A. Giustiniani, Musica de B. Marcello, Patrizi Veneti.' It is of high excellence, and the music was adapted to our translation of the Psalms by Mr. Garth, organist of Durham. Marcello composed many other works, but few have survived. He did not confine his attention to music, but was an active magistrate, and during many years one of the Council of Forty. He died in 1739.

MARCELLUS, MARCUS CLAUDIUS, born of a Roman consular family, after passing through the offices of ædile and quæstor, was made consul B.C. 224. At the beginning of the second Punic war, Marcellus was sent to Sicily as prætor to administer the Roman part of the island, and to keep the Syracusans firm to their alliance with Rome. After the battle of Cannæ he was recalled to Italy, to oppose Hannibal. He took the command of the relics of the Roman forces in Apulia, kept Hannibal in check, and defended Nola. In the year 214 B.C., being again consul, he took Casilinum by surprise. He was next sent to Sicily, where Syracuse had declared against Rome. After a siege of nearly three years, the town was taken in the year 212 B.C. Archimédes lost his life on the occasion of this taking of Syracuse. In the year 210 he was again chosen consul, and had the direction of the war against Hannibal in Apulia, in this and in the following year. In B.C. 208 Marcellus was elected consul, for the fifth time. He continued to carry on the war against Hannibal, when, being encamped near Venusia, he fell into an ambuscade and was killed. Hannibal caused his body to be buried with honours. (Livy, xxvii. 2, 14, 29.) He was one of the most distinguished Roman commanders during the second Punic war, and had the honourable reputation of being a disinterested man.

MARCELLUS, U'LPIUS, a Roman jurist, who lived under Antoninus Pius and his successors. He was employed by Pius as one of his legal advisers, and also apparently by Aurelius, the successor of Pius ('Dig.' 28, tit. 4, s. 3), for Marcellus speaks of the proceedings in a case before Aurelius, A.D. 166, in which the emperor delivered judgment. There are 159 excerpts from Marcellus in the 'Digest.'

MARCELLUS I. II. [POPE.]

MARCGRA'VIACEÆ, a natural order of

Polypetalous exogens, having an imbricated calyx, numerous hypogynous stamens, and a superior ovary with a discoid stigma and many polyspermous cells. They are all inhabitants of the tropical parts of America, and are usually scrambling shrubs, which are sometimes true parasites. The order is of no known use, and of but little interest, except in a systematical point of view; unless for the sake of its very curious bracts, which vary in form in different species, but which are more or less usually pitcher-shaped.

MARCH, the third month of the year according to modern computation, containing 31 days. The Roman year originally began with March; and in England, before the alteration of the style, the legal year commenced on March 25. The name of the month is said to be derived from that of Mars, the god of war.

MARCH, in music, is, properly speaking, an air in duple time, played by martial instruments, to mark the steps of the infantry, as well as to amuse and cheer troops of all kinds. It has however long since gained admission into sacred as well as into operatic musical compositions, as, for instance, the marches in Handel's oratorios; the religious marches in Gluck's 'Alceste,' and Mozart's 'Zauberflöte;' the two funeral marches of Beethoven, &c.

MARCH. [CAMBRIDGESHIRE.]

MARCHANTIA'CEÆ, a small natural order of Acrogens or Cryptogamic plants, forming part of the old group called *Hepaticæ*. They are plants of a low organisation, in most instances having no distinction of leaves and stem, but a thin, leafy, lobed thallus in their room, in which respect they resemble lichens; but are furnished with breathing pores and an approach to spiral vessels in the form of elaters, which latter circumstances elevate them to the level of *Lycapodiaceæ* and *Marsiliaceæ*.

Marchantiaceæ differ from *Jungermanniaceæ*, with which they were formerly combined under the old name of *Hepaticæ*, in not having a distinct stem, and in their fruit not being four-valved. *Marchantia* itself, a common plant under the north side of old walls and hedges, upon damp ground, forms deep green patches with a lobed lichenoid thallus, and has reproductive organs of two kinds arranged separately below mushroom-shaped heads.

MARCHE, LA, one of the old provinces into which France was divided before the Revolution, was bounded N. by Berri, E. by Auvergne, S. by Limousin, and W. by Poitou and Angoumois. It now forms the department of Creuse, and part of the arrondissements of Limoges and Bellac in the department of Haute-Vienne.

The province was divided into Haute-Marche and Basse-Marche, the capitals of which were Guéret and Bellac respectively.

MARCHES. *Mark* is a word common to almost all the languages of Teutonic origin, in sense scarcely varying from the word as at present used, a *mark*. But from denoting a mark in general, it came to denote in a specific and peculiar sense those important marks by which the boundaries of wide domains were indicated, and in this sense it is found in Anglo-Saxon writings. Hence the word *The Marches*, that is, the country lying near and about the *marks* which indicated the limits of two kingdoms, dukedoms, or other extensive jurisdictions.

The word is used in Germany, and upon it is founded one of their titles of honour, the *mark-graf* (*margrave*), or lord of the marches; and our own *marquis* is of the same origin. The Marches of Wales and of Scotland was a term in use in our history until the union of those countries with England.

MARCIA'NUS, born in Thrace, of obscure parents, towards the end of the fourth century, entered the army, rose gradually by his merit to high rank, and was made a senator by Theodosius II. When Theodosius died (A.D. 450) his sister Pulcheria, then fifty-two years old, offered her hand to Marcianus, who was near sixty, because she thought him capable of bearing the crown with dignity and advantage to the state. Marcianus married her, and was proclaimed emperor. His reign, which lasted little more than six years, was peaceful, and his administration was equitable and firm. In the year 455 Marcianus acknowledged Avitus as emperor of the West. Marcianus died in 457; his wife Pulcheria had died before him. He was succeeded by Leo I.

MARCIANUS ÆLIUS, a Roman jurist, who was writing after the time of Septimus Severus. He also survived Caracalla, the successor of Severus. There are 275 excerpts from Marcianus in the 'Digest.'

MARCIENNES. [NORD.]

MARCIONITES, a religious sect of the second and third centuries, so called from their teacher Marcion, who adopted the old Oriental belief of two independent, eternal, co-existing principles, one evil and the other good. He endeavoured to apply this doctrine to Christianity. The Marcionites spread far in the East, and especially in Persia. The chief opponent of Marcion was Tertullianus, who wrote a book to refute his doctrines.

MARDIN, a town of Northern Mesopotamia, built on a steep hill which forms part of the chain that divides the basin of the Upper Tigris, or country of Diarbekr, from the plains of Sinjar, which are watered by the affluents of the Euphrates. Mardin is a considerable though poor town, and is said to contain 20,000 inhabitants, two-thirds of whom are Moslems, and the rest Christians, with some Jews. Mardin has eight mosques, several bazaars, and some public baths. The castle, which is built on the summit of the hill above the town, is strong by its situation. The town of Mardin is nearly half-way between Diarbekr and Mozul, and on the road from Constantinople to Bagdad.

MAREMME, the name given to the unwholesome lowlands which extend along the Mediterranean coast in Tuscany and the Papal States. The Tuscan Maremme begin N. of Lucca, and extend, with but few interruptions, from the approach of the highlands to the sea, as far as the mouth of the Pescia, which river divides Tuscany from the Papal States. They stretch inland generally from 10 to 12 miles. The government of the present

Grand Duke of Tuscany has effected great improvements in these districts; the marshes have been drained, the lakes and rivers embanked, and the land has been brought into tillage, and colonies settled upon it. The Roman Maremme begin at the Pescia and extend as far as Terracina on the Neapolitan frontier, a length of above 120 miles, with a very unequal breadth inland, owing to the approach of various offsets of the Apennines to the sea. The whole of this tract is low and unimproved, and, whether the surface be marshy or dry, it is unwholesome, especially in summer. The Maremme in the Neapolitan territory are designated by the term *paduli*, a corruption of *paludi*, which means marsh-lands.

MARENNES. [CHARENTE INFE'RIEURE.]

MARE'NZIO, LUCA, a voluminous and excellent composer of madrigals, was born at Concaglia in Brescia, about the middle of the 16th century. He lived much at Rome, and was in the pope's service, though it is not exactly known in what capacity. He died at Rome in 1599. Handel and Purcell, as Dr. Burney remarks, did not disdain to become his debtors.

MAREO'TIS, Lake. [ALEXANDRIA; EGYPT.]

MARGARET OF ANJOU. [HENRY VI.]

MARGARIC ACID, a fatty acid, so called by Chevreul, who discovered it, from 'margarites' (*μαργαρίτης*), *a pearl*, on account of its peculiar lustre. It is prepared from soap made with olive-oil and potash. It crystallizes in pearly needles; it is insoluble in water. It has an acid reaction; and its salts, except those of the alkalis, are very sparingly soluble in water. Its saline compounds are termed *margarates*. According to Berzelius, it consists of O^3, H^{33}, C^{35}.

Margarate of Potash presents the varied forms of brilliant scales, a solution, and a jelly, according to its mode of preparation. The *Bimargarate of Potash*, and the *Margarates of Soda and of Lead*, bear a good deal of resemblance to it.

MARGARIN, a peculiar fatty matter contained in vegetable oils, and also in animal fats, as mutton-suet and hog's-lard. This substance is very soluble in cold æther, which distinguishes it from stearin.

MARGARITIC ACID, a solid compound of oxygen, hydrogen, and carbon, which, together with *ricinic* and *elaiodic acid*, results from the formation of a soap of castor oil and hydrate of potash.

MARGARITO'NE D'AREZZO was born at Arezzo, about 1215. He was a painter of the Byzantine school, and of great reputation in his day. He painted the interior of the church of San Clemente, in Arezzo, an old church which was destroyed by duke Cosmo de' Medici in 1547. Most of Margaritone's works have now perished; but one, considered one of his masterpieces, namely, San Francesco, painted for a convent in Sargiano, still exists, and is engraved in Lastri's 'Etruria Pittrice,' i. 7.

In sculpture, says Vasari, Margaritone was more successful than in painting. There is still by him, in the cathedral of Arezzo, a reclining marble statue of Gregory X. on a monument, which, according to Vasari, is his masterpiece. As an architect, Margaritone conducted the building of the cathedral of Arezzo. He died at Arezzo, aged 77, and was buried there.

MA'RGARON, a solid white fatty matter which crystallizes in pearly scales, and is obtained by distilling margaric acid with excess of lime.

MARGATE. [KENT.]

MARIA THERE'SA, Archduchess of Austria, Queen of Hungary and Bohemia, and Empress of Germany, born in 1717, was the eldest daughter of Charles VI. of Austria, Emperor of Germany. [CHARLES VI.] In 1724, Charles, by the Pragmatic Sanction, regulated the order of succession in the family of Austria, declaring that, in default of male issue, his eldest daughter should be heiress of all the Austrian dominions, and her children after her.

In 1736 Maria Theresa married Francis of Lorraine, grand duke of Tuscany. Upon the death of Charles VI., in 1740, the King of Prussia, the Elector of Bavaria, the Elector of Saxony, and the kings of France, Spain, and Sardinia, agreed to dismember the Austrian monarchy, to parts of which each of those powers laid claim. Maria Theresa, in spite of the threatened encroachments of those powers, supported by the enthusiastic efforts of the Hungarians, to whom she appealed, made good her claim as empress. She drove the French and Bavarians out of her kingdom. Her political acts are worthy of record. She abolished the torture, commuted the services which the Bohemian peasants owed to their feudal superiors, put a stop to literary piracy, established a national system of education, and made several important reforms in the temporalities of the clergy. She will ever rank among illustrious women and the benefactors of mankind. She died at Vienna, Nov. 29, 1780.

MARIA'NA, JUAN, was born at Talavera in 1536. At the age of seventeen he joined the Jesuits, and devoted much study to theological subjects; but he is best known for his 'History of Spain,' published first in 20 books, in 1592, and subsequently extended in 1605 to 30 vols. This work has been translated into English by Stevens. The profound erudition of Mariana is also displayed in his 'Tractatus Septem,' Cologne, 1609. At the age of eighty-three he published his 'Scholia' on the Old and New Testaments, availing himself of the best Hebrew commentaries, and some valuable and very early MSS. which dated from the age of the ancient Gothic dominion in Spain. This work secured for him a place among the best commentators in the 'Histoire critique du Vieux Testament' of the hypercritical Father Simon, who is usually unfavourable to Spaniards. Mariana left MSS. of at least twice the extent of all his publications. He died at Toledo, Feb. 6, 1623.

MARIE ANTOINETTE, born at Vienna, November 2, 1755, was the daughter of Francis of Lorraine, emperor of Germany, and of Maria Theresa of Austria. In May, 1770, she married Louis, the dauphin, grandson of Louis XV., who in 1774 became King of France, under the name of Louis XVI. When the Revolution began, Marie Antoinette was on the side that was for

making resistance. Marie Antoinette was one of the advisers of the attempted flight of the king, which proved unsuccessful, and only served to excite the public animosity against her and her husband. She showed great courage during the various attacks made against the royal family. Her demeanour, under the most trying circumstances, never lost its dignity. After the death of her husband, she seemed forgotten for a time in the prison of the Temple; but she was brought to trial before the revolutionary tribunal Oct. 14, 1793, found guilty, and condemned to death. In the presence of her judges, the burst of indignant maternal feeling with which she appealed to the mothers who might be there present, when an infamous and absurd charge was brought against her, overawed even her accusers.

On October 16, 1793, she was removed in a common cart from the prison of the Conciergerie to the place of execution. On her way she was reviled and abused by the ferocious mob in the most unfeeling manner; but she appeared heedless of their vociferations, and suffered death with firmness and composure. She was 38 years of age, but her sufferings had given her a much older appearance. She left one son, who died in prison (Louis XVII.), and a daughter, who is the present Duchess of Angoulême.

MARIE DE' MEDICI, the daughter of Francis I., grand duke of Tuscany, and of the Archduchess Joan of Austria, was born at Florence in 1573, and was married in 1600 to Henri IV. of France. Her unhappy temper led her to quarrel with her husband, and subsequently with her son. She was at last exiled for her political intrigues, and died at Cologne, in 1642, almost destitute.

MARIE-GALANTE, an island in the Caribbean Sea, about 15 miles south of Guadaloupe, of circular form and about 14 miles in diameter, was discovered by Columbus in 1493, and first settled by the French in 1647. The surface is of moderate elevation, and rises gradually towards the north; the western coast is low. The soil is productive, and yields abundantly the several West-Indian products. The population is said to be about 10,000.

MARIE-AUX-MINES. [Rhin, Haute.]

MARIENBURG. [Danzig.]

MARIENWERDER, one of the two governments into which West Prussia is divided, is bounded N. by the government of Danzig, E. by that of Königsberg, S. by Poland and Posen, and W. by Brandenburg. Its area is 6759 square miles, and the population in 1847 was 613,300. The government is divided into 13 circles.

Marienwerder, the capital, situated on the Liebe and the Little Nogat, 2 miles from the Vistula over which there is a pontoon bridge 2700 feet in length, has 5500 inhabitants. It is a very neat town, with four suburbs. It is the seat of the provincial courts and the government offices. There are manufactories of woollens, hats, soap, and leather. The breweries and distilleries are very considerable. The other towns are—*Thorn*, the birthplace of Kepler, which is a fortified town on the Vistula, here crossed by a long bridge, and has 8000 inhabitants: *Culm*, or *Kulm*, also on the right bank of the Vistula, with a population of 5394, and some cloth factories: and *Graudenz*, which also stands on the right bank of the Vistula, here crossed by a bridge of boats, and has 5918 inhabitants, who manufacture woollen cloths and tobacco, and trade in corn. The town is surrounded by a wall, and defended by a strong fortress which commands the course of the Vistula.

MARIESTAD. [Sweden.]

MARIGOLD. [Calendula.]

MARINE INSURANCE. [Ships.]

MARINER'S COMPASS. [Compass, Mariner's.]

MARINES, men embodied to serve as soldiers on board of ships of war in naval engagements; and on shore, in the event of a descent being made upon an enemy's coast. In the British service they also assist occasionally in performing some of the operations connected with the working of the ship; they cannot however be sent aloft at the command of a naval officer.

During the reign of William III. the soldiers placed on the establishment of the navy seem to have been retained as persons in training to become good seamen; and, as soon as they became qualified they were discharged from the regiment, and entered on the ship's books as foremast men. In 1755, on the recommendation of Lord Anson, the existing regiments having been disbanded, 130 companies of marines were raised, and placed under the immediate command of the Lords of the Admiralty. The corps of marines, as it was then called, was subsequently much increased; and during the late war its strength amounted to above 20,000 men, exclusive of two companies of marine artillery.

The royal corps is commanded by a Lieutenant and a Major General, who are also naval officers. No commissions in the corps are obtained by purchase, and the officers of marines rise by seniority, as high only however as the rank of colonels-commandant. The marines are now clothed and armed in the same manner as the infantry of the line. In an engagement at sea, they annoy the enemy by a fire of musketry from the tops and deck; and they repel with the bayonet any attempt to board the ship.

MARINO, SAN. [San Marino.]

MARIOTTE, EDME. Little is known of his life. He was a Burgundian born, a priest by profession, and resided in the earlier part of his philosophical career at Dijon. He was afterwards prior of Saint Martin, near Beaune, and died May 12, 1684, having been one of the first members of the Academy of Sciences. See the éloge by Condorcet, vol. i. p. 74, of his collection.

The principal results by which the name of Mariotte is known to a reader of modern works are the following:—

1. He was the discoverer of that law of elastic fluids which now goes by his name; that is, of the elastic force being exactly in the inverse proportion of the space which a given mass of fluid occupies. Subject to such alterations as difference of temperature may require, the formula

derived from this law is now one of the fundamental parts of aerostatics.

2. He discovered that air, and air in a state of condensation, exists in liquids.

3. He found that the part of the retina in which it meets the optic nerve is not capable of conveying the impression of sight.

Among minor matters, we may mention the now common guinea and feather experiment, which he first made with the air-pump.

MARITIME LAW. [SHIPS.]

MARITZA. [BALKAN; THRACE.]

MA'RIUS, CAIUS, was born of humble parents at Arpinum, about B.C. 157. He served at the siege of Numantia, B.C. 134, under Scipio Africanus, together with Jugurtha, where he highly distinguished himself. In B.C. 119 he was elected tribune of the plebs, in which office he showed himself a most determined enemy to the patrician order. He obtained the prætorship with difficulty, in consequence of the opposition of the patrician order, who accused him of having used bribery. Marius married Julia, who was aunt to Julius Cæsar.

In B.C. 109 he accompanied Metellus into Africa in the capacity of *legatus* (second in command); and by his prudence and courage in the war with Jugurtha he added greatly to his military reputation. His friends at Rome persuaded the people that the war with Jugurtha would never be concluded until the command was given to Marius. Metellus with some difficulty allowed his lieutenant leave of absence to go to Rome in order to stand for the consulship. Marius obtained the consulship (B.C. 107) and the command of the Jugurthine war. In the following year (B.C. 106) he obtained possession of Jugurtha, who was treacherously given up by Bocchus to his quæstor Sulla. [JUGURTHA.] The news of the defeat of the Consul Manilius, and the Pro-Consul Cæpio by the Teútones and Cimbri (B.C. 105), caused the greatest consternation at Rome; and Marius was elected consul during his absence in Africa.

Marius entered upon his second consulship B.C. 104, and he was again chosen consul in the two following years (B.C. 103, 102). In his fourth consulship (B.C. 102), Marius defeated the Teutones and Ambrónes near Aquæ Sextiæ (*Aix*) in Gaul; and in the following year, B.C. 101, Marius, who was again elected consul, for the fifth time, joined his forces with those of Catulus, and entirely defeated the Cimbri in the plain of Vercellæ (Vercelli) situated to the north of the Po.

Marius again became a candidate for the consulship for the following year; but the fear of the Gallic invasion was removed, and he was opposed by the patrician party. He nevertheless obtained the consulship, in great part owing to the exertions of Saturninus, the tribune. At the expiration of his consulship Marius left Rome; but in B.C. 90 the Marsian or Social war broke out, in which Marius and Sulla were engaged as legati to the two consuls. But disgusted, it is said, with the increasing reputation of Sulla, Marius resigned his command before the conclusion of the war.

The Marsian war had scarcely been brought to an end, before a war broke out between Marius and Sulla. The command of the Mithridatic war had been assigned to Sulla, who was now consul (B.C. 88); but Marius used every effort to wrest it from him. He was warmly supported by P. Sulpitius, the tribune, and a law was passed that the command should be taken from Sulla and given to Marius. Sulla was with the army at the time besieging Nola; but as soon as he heard of the law, he marched to Rome; and Marius and his adherents were obliged to quit the city. Marius escaped with the greatest difficulty to Africa; but in the following year (B.C. 87), in the absence of Sulla, who had gone to Greece to oppose Archelaus, he returned to Italy to join the Consul Cinna, who had been driven from Rome by his colleague Octavius, supported by the patrician party. Marius and Cinna, with the assistance of Carbo, blockaded the city, and as soon as they got possession of it, a general massacre of the opposite party ensued. All the leaders of the patrician party who were unable to escape from Rome were put to death.

Marius and Cinna declared themselves consuls for B.C. 86, without holding the comitia; but Marius died in the beginning of the year. His Life is written by Plutarch.

MARIVAUX, PIERRE CARLET DE CHAMBLAIN DE, was born at Paris, in 1688. He wrote some dramas, but his celebrity rests upon his novel-romances. He is best known for his 'Vie de Marianne,' and the 'Paysan Parvenu.' Marivaux also wrote another romance, entitled 'Pharsamon,' inferior to the first two; also 'Le Spectateur François,' and 'Le Philosophe Indigent.' He died at Paris in 1763.

MARJORAM, an aromatic potherb used in cookery, especially among the French. It is the *Origanum majorana* of Linnæus, or *Majorana hortensis* of Mœnch, a native of Barbary and the Himalaya mountains. In gardens it is little better than an annual; in a wild state it is a suffruticose perennial.

MARK. [MONEY.]

MARK, ST., the Evangelist, is supposed to be the same person as John Mark, who is mentioned in the Acts of the Apostles (xii. 12, 25; xiii. 5, 13; xv. 37). He was the son of Mary, a pious woman at Jerusalem, in whose house the disciples were wont to meet (Acts xii. 12), and the nephew of Barnabas (Col. iv. 10). He left Jerusalem with Paul and Barnabas, about A.D. 44 (Acts xii. 25), and accompanied them in their return to Antioch, and thence in their mission (Acts xiii. 5), as far as Perga in Pamphylia, where he parted from them and returned to Jerusalem (Acts xiii. 13). About A.D. 53 we find him again at Antioch, when Paul proposed to Barnabas to visit the Asiatic churches. Mark accompanied Barnabas alone to Cyprus (Acts xv. 37–39). There appears to have been some disagreement between Mark and Paul, but they were afterwards reconciled, for we find him at Rome with the apostle during his imprisonment. That Mark was also at Rome with Peter (1 Pet. v. 13), is the only other particular concerning him

which the Scriptures contain. According to Eusebius, Epiphanius, and Jerome, he afterwards went to Egypt, and founded a church at Alexandria, where he died and was buried, according to Jerome, in the eighth year of Nero's reign, A.D. 62. But this date appears to fix his death earlier than other circumstances in his history warrant.

The genuineness and authenticity of the 'Gospel according to St. Mark' are attested by the unanimous voice of ecclesiastical writers. Michaelis has indeed objected to its canonical authority, in common with that of Luke, but on no good ground. The time when it was written is uncertain, probably about A.D. 64 or 66.

According to the unanimous testimony of the early ecclesiastical authors, the gospel of Mark was written in Greek, at Rome, and under the instructions of St. Peter.

MARKET, a public place and fixed time for the meeting of buyers and sellers. A legal market can exist only by virtue of a charter from the crown or by immemorial usage, from which it will be presumed that a royal charter once existed, although it can be no longer produced. A market is usually granted to the owner of the soil in which it is appointed to be held, who, as such grantee, becomes the owner, or lord, of the market. In upland towns, that is, towns which, not being walled, had not attained the dignity of boroughs, markets were frequently granted to lords of manors; but in walled towns or boroughs, particularly in such as were incorporated, the ownership of the soil having usually, by grant from the crown, or other lords of whom the borough was originally holden, been vested in the incorporated burgesses, the practice has commonly been to grant markets to the municipal body.

Formerly markets were held chiefly on Sundays and holidays, for the convenience of dealers and customers, who were brought together for the purpose of hearing divine service. But in 1285, by 13 Edward I. c. 5, fairs and markets were forbidden to be held in churchyards; and in 1448, by 27 Henry VI. c. 5, all showing of goods and merchandise, except necessary victuals, in fairs and markets, was to cease on the great festivals of the church, and on all Sundays except the four Sundays in harvest. The holding of fairs and markets for any purpose on any Sunday was prohibited in 1677, by 29 Charles II. c. 7.

It is a rule of the common law (subject to some exceptions) that every sale in market-overt (open market) transfers to the buyer a complete property in the thing sold; so that however defective the title of the vendor may be, that acquired by the vendee is perfect, even where the property belongs to a person who is under legal disability, as an infant, a married woman, an idiot, or a person in prison or beyond sea. In the city of London every shop is market-overt for goods usually sold there.

A market is generally appointed to be held once, twice, or three times in a week, for the current supply of commodities, mostly of provisions. A large market held once or twice a year is called a fair; and, according to Lord Coke, a large fair held once a year is a mart.

Fairs have all the legal incidents of markets, and are subjected to further regulations by 2 Edward III. c. 15, one of which requires, that at the opening of the fair, proclamation be made of the time that it is to continue.

MARKET-HARBOROUGH. [LEICESTERSHIRE.]

MARKET-RASEN. [LINCOLNSHIRE.]

MARKLAND, JEREMIAH, was born the 29th of October, 1693, at Childwall, in Lancashire. He was sent to St. Peter's College, Cambridge, in 1710, and became a fellow and tutor of his college. During the latter part of his life he resided in retirement at a small village near Dorking, where he died on the 7th of July, 1776.

Markland devoted a long life to the diligent study of the Greek and Roman writers. He was one of the best English scholars and critics of the last century, but wrote very little. He edited the 'Supplices' (1763), and the two Iphigenias of Euripides (1771), which have been republished by Gaisford. In 1745 he published 'Remarks on the Epistles of Cicero to Brutus, and of Brutus to Cicero, in a Letter to a Friend;' in which he attempts to prove that they could not have been written by Brutus or Cicero; and in an Appendix to this work he also maintains that the four orations which occupy a place in Cicero's works, under the titles of 'Pro Domo sua apud Pontifices,' 'De Haruspicum Responsis,' 'Post Reditum in Senatu,' and 'Ad Quirites post Reditum,' are also spurious. This opinion has been supported by F. A. Wolff and many other able critics.

MARL, an earthy substance found at various depths under the soil, and extensively used for the improvement of land. It consists of calcareous and argillaceous earth in various proportions, and as the former or the latter prevails, so it is beneficially employed on clays or sands. There are several distinct sorts of marl—clay marl, shell marl, slate marl, and stone marl. The effect of marl is the same as that of clay and chalk upon sandy soils; on heavy soils its effect is proportioned to the quantity of calcareous earth which it contains. The peculiar advantage of marl is its readily crumbling to powder by the effect of air and moisture.

Marl is often found very near the surface, so as to mix with the soil in ploughing; but unless there be a sufficient depth of soil above, its presence does not indicate great fertility. It is generally best when found at a moderate depth, so as to be readily dug out and carted on the adjacent lands. Marl, when put fresh upon the land, requires some time in order to become effective. It should therefore be laid on the surface and spread before winter, leaving it there for a considerable time before it is ploughed in. It is most advantageous to put it on the land when it is in grass, and to roll and harrow it repeatedly, in order to expose it to the effect of the air and rains. Alternate frosts and thaws greatly assist its pulverization.

An excellent use of marl is in forming composts with dung and peat earth. It is laid in layers with the dung and peat, and if the heap is well soaked with urine or the washings of stable-yards,

it will in a short time become a most valuable manure for all kinds of soils.

MARLBOROUGH. [WILTSHIRE.]

MARLBOROUGH, JOHN CHURCHILL, DUKE OF, was born at Ashe in Devonshire, June 24, 1650. He was the second son of Sir Winston Churchill, whose fortunes had suffered in the civil war, through his devotion to the royal cause; and whose loyalty, after the Restoration, was rewarded with sundry small offices for himself, and the more questionable benefit of appointments for his children in the profligate court of Charles II. Arabella Churchill, his daughter, became mistress to the Duke of York, afterwards James II.; and John Churchill, who was appointed page to the same prince, doubtless owed his early advancement to this disgraceful connexion.

Feeling a strong desire for a military life, John Churchill obtained a commission, and served abroad with the English troops sent as auxiliaries to Louis XIV. in his war against the Dutch. Churchill distinguished himself in his early campaigns, and attracted the notice of the illustrious Turenne. On the conclusion of the peace of Nimeguen he returned to England, and formed an ardent attachment for Sarah Jennings, a young lady of birth, genius, and beauty, and of irreproachable purity in a vicious age. They were married, and for a time both continued in the ducal household, but when the Princess Anne was married, Lady Churchill became a lady of her bedchamber. Churchill had previously been raised, through the interest of James, to a Scotch barony. When James succeeded his brother on the throne, Churchill was further promoted to an English peerage by the style of Baron Churchill of Sandridge. Under this title he contributed to the suppression of Monmouth's rebellion, and was rewarded with his master's unbounded reliance on his fidelity.

This confidence he betrayed, before and after the landing of William of Orange, with a deliberate treachery. After offering his services to the Prince of Orange, he accepted the command of a large body of James's troops to oppose him; after accepting that command, he deserted to the prince; and when William became king, he received at his hands the title of earl of Marlborough, and the offices of privy-counsellor and lord of the bedchamber. His subsequent conduct throughout the reign of William was consonant to this outset: for he corresponded and intrigued with the exiled king. William III., who knew equally well how to estimate the capacity and the sincerity of Marlborough, alternately imprisoned and employed, cashiered and recommissioned, the man whom he recommended to his successor as the fittest person to 'lead her armies and direct her councils.' The favour of Marlborough's wife with Queen Anne was probably a more powerful, though less rational, motive for the appointment which he now received to the command of the allied forces in the war of the Spanish succession.

When Marlborough landed at the Hague, in June, 1702, he had to encounter many difficulties, arising from jealousies and disputes among the allies, notwithstanding which he compelled the French armies to retreat in all quarters, delivered the Dutch frontiers from their presence, and closed the campaign by the sieges and capture of Venloo, Ruremond, Stevenswaert, and Liège. For these services Queen Anne created him duke of Marlborough.

In the following campaign of 1704, he executed, upon his own responsibility, the bold design of marching into Germany at the head of the English troops. He formed a junction on the Danube with the Imperialists; stormed the strong Gallo-Bavarian lines at Donauwerth; and finally, in concert with the Imperial commander Prince Eugene of Savoy, a kindred spirit, attacked the enemy on August 13, 1704, at Blenheim on the Danube, with such skill and impetuosity as to inflict on them a total defeat. For this great exploit Marlborough was rewarded with the conveyance to himself and his heirs of an estate at Woodstock, on which it was also resolved to erect for him a palace. This design was ultimately realized, under the direction of the architect Vanbrugh. The war continued, and in 1706 he gained the great battle of Ramilies, in which the enemy sustained a loss of 13,000 men, eighty standards, and all their cannon, and were compelled to evacuate the whole of Spanish Flanders. Brussels, Ghent, Antwerp, and Oudenarde opened their gates to the conqueror, and the strong fortresses of Ostend, Menin, Dendermonde, and Ath were reduced by regular sieges.

In 1708 an attempt of the enemy to recover possession of Spanish Flanders brought on a general engagement at Oudenarde, which terminated in the utter rout of the French under the dukes of Burgundy and Vendôme, with a loss of 14,000 men. In 1709 occurred the sanguinary combat of Malplaquet, the most dubious of Marlborough's exploits; since, though he was undoubtedly victorious, the assault of an immense army under Villars, in a position of tremendous strength, has exposed him and his colleague Eugene to the charge of reckless temerity. In 1710 Marlborough forced the French lines, and captured Douay, Bethune, and other posts. Villars employed the autumn and winter in constructing a series of entrenchments on the Flemish frontiers, and openly boasted of having 'at last brought Marlborough to his *ne plus ultra*.' Never did the military genius of Marlborough break forth with more splendour than in this, which was destined to be his final campaign. On August 5, 1711, he burst through the lines of his antagonist near Bouchain, formed the siege of that strong fortress, and effected its capture—his last achievement—under the eyes of the superior French army.

The rest of his life was spent in England. He was deprived of his military command by Queen Anne, to spite her former friend, but now her open political enemy, his wife; but he was restored by George I. to his military honours, and died June 10, 1722. Leaving no male issue, his title descended to the son of his youngest daughter, who had married the earl of Sunderland.

The principal biographies of Marlborough, and

memoirs relating to his campaigns are—1, Lediard's Life of him (3 vols. 8vo., London, 1736). 2, An anonymous Life, published in 8vo. in 1713, and accompanied by a Life of Prince Eugene, evidently written by one who had served under the duke and shared his confidence. 3, Coxe's 'Memoirs of John, duke of Marlborough' (3 vols. 4to., London, 1818–19.) 4, Kane's 'Campaigns of King William and Queen Anne, from 1689 to 1712,' 8vo., 1745. 5, The 'Private Correspondence of the Duchess of Marlborough,' 2 vols. 8vo. 6, The Marlborough Despatches were published in 1847.

MARLOW, GREAT. [Buckinghamshire.]

MARLOWE, CHRISTOPHER, was born, according to Malone, in 1565. All that is known of his life may be given in a very few lines. He was entered of Corpus Christi College, Cambridge, took his bachelor of arts degree in 1583, and that of master of arts in 1587. On leaving the university he became a dramatic writer and perhaps an actor. His moral character appears to have been bad. He was killed in a quarrel of a disgraceful nature, June 1, 1593.

The following plays are attributed to him :—'Dr. Faustus,' 'Edward the Second,' 'The Jew of Malta,' 'Tamburlaine the Great,' 'Lust's Dominion,' 'The Massacre at Paris,' and 'Dido, Queen of Carthage.' The prevailing opinion however is that the first three only are his sole productions.

To Marlowe we are indebted for the first regular form of the English drama cleared of rhymes; and he may be considered as the link between Shakspere and the Moralities. 'Faustus' is nearly a 'morality;' 'Edward the Second' is a regularly formed 'history.' Besides his plays, Marlowe translated Ovid's 'Art of Love,' and some other classical works.

MARLSTONE, in Geology. Sandy, calcareous, and irony strata, which divide the upper from the lower lias clays, are thus designated. This mass of rocks is nowhere so well developed as in Yorkshire and Leicestershire.

MARMALADE, a sort of preserve made with sugar and the Seville or bitter orange, a variety of the fruit of the *Citrus Bigaradia*. It is more wholesome when properly made, *i.e.* when the rind is soft, than most other sweet preserves, as the bitter communicates tonic and stomachic properties to it.

MARMANDE. [Lot-et-Garonne.]

MARMION, SHAKERLEY, the son of a Northamptonshire squire, was born in that county, became a gentleman commoner of Oxford in 1617, and proceeded master of arts in 1624. He became one of the officers in the troop raised by Sir John Suckling for the king in his expedition against the Scots. But, becoming sick at York, he returned to London, and died in 1639. Besides small scattered poems, he wrote three plays: 'Holland's Leaguer;' 'A Fine Companion,' and 'The Antiquary,' a drama of considerable merit, which is reprinted in Dodsley's Collection.

MARMARA, or MA'RMORA, SEA OF, the *Propontis* of the ancients, is situated between the Grecian Archipelago and the Black Sea, communicating with the former by the Dardanelles, the ancient Hellespont, and with the latter by the strait of Constantinople, the ancient Bósporus. Towards the east it terminates in the long and narrow gulf of Ismid, and towards the south-east in the gulf of Modanieh. It is comprehended between 40° 18′ and 41° 5′ N. lat., and 26° 40′ and 30° 5′ E. long. Its extreme length from W. to E., including the gulf of Ismid, is about 180 miles; from strait to strait in a W.S.W. and E.N.E. direction, 110 miles; and its greatest breadth is 43 miles. The sea is very deep. There are no tides, but a current sets in from the Bosporus.

The most remarkable islands in this sea are, Marmara, the ancient *Proconnésus*, celebrated for its marble quarries, Rabi, and Liman-Pasha, occupying its western division; Papa, or Kalolimno, off the gulf of Modanieh; and the group called the Princes Islands, near the Asiatic shore, about ten miles S.E. from Constantinople. The Princes Islands are nine in number, two of which, Oxeia and Rata, are uninhabited. Of the others Prinkipos (the ancient *Pityusa*) and Kalki (the ancient *Chalcítis*) were once distinguished for their copper-mines. The peninsula of Artaki was formerly an island, on which stood the flourishing city of *Cyzicus*, the ruins of which are still to be seen. The modern town of Artaki contains about 4000 inhabitants, and has some trade in wine, oil, and silk.

MARMONTEL, JEAN FRANÇOIS, was born at Bort in Limousin, in 1723. At an early age he became professor of philosophy at a seminary of the Bernardins at Toulouse, and supported his mother and family after the death of his father. An acquaintance with Voltaire brought him to Paris in 1745. Voltaire introduced him to several persons of distinction, and the success of his first tragedy, 'Denys le Tyran,' stamped him as a dramatic poet. His celebrated 'Contes Moraux' gained him great reputation. On the death of Duclos he became Historiographer of France; and in 1783 he was made secretary to the Académie in the place of D'Alembert. He lost his appointments and his property on the breaking out of the Revolution, and he removed some distance from Paris in a state of destitution. In 1796 he became a member of the National Institute, and in 1797 was elected into the council of the ancients, but this election having been reversed after the 18th Fructidor (Sept. 4) in the same year, he retired to Abbeville, where he died in 1799, and was buried in his own garden by Catholic priests.

MARMOT. [Muridæ.]

MARNE, a department in France, formed out of a portion of the province of Champagne, is bounded N. by the departments of Aisne and Ardennes, E. by those of Meuse and Haute-Marne, S. by that of Aube, and W. by Seine-et-Marne and Aisne. Its greatest length from N.E. to S.W. is 81 miles, from N.W. to S.E. 74 miles. The area is 3154 square miles, and the population in 1846 was 367,309, which gives 116·43 to the square mile, being 57·32 below the average per square mile for the whole of France.

The department presents a bare plain, sloping generally towards the west, and broken here and there by steep isolated hills, that nowhere exceed 1200 feet in height or two miles in length. From the centre of the department almost to its extremities the arid and almost barren soil consists of a thin layer of sandy earth not two inches in depth, and resting on a chalk bottom; bushes are rare; the villages far apart. Between Reims and Fismes the land is good, and along the western border, and in the valley of the Marne, there is some strong deep land. Again in the Perthois district in the south-east of the department, along a considerable margin from Vitry to Sainte-Ménéhould, and in the valley of the Aisne, the soil is in general rich and productive.

The department takes its name from the river *Marne* (the *Matrona* of Julius Cæsar), which rises in the department of Haute-Marne, about 3 miles S. from Langres, and flowing nearly N. past St.-Dizier, then sweeps round to the west, and enters the department of Marne: here its course is N.W. past Vitry and as far as Châlons, whence it flows W., and continues in this general direction across the south of the department of Aisne, the north of Seine-et-Marne, and to its junction with the Seine at Charenton, in the department of Seine-et-Oise. Its whole length is 217 miles, of which 147, from St.-Dizier to its mouth, are navigable. Its principal feeders on the right bank are the Rognon, the Saulx (which receives the Ornain), and the Ourcq; on the left bank the Blaise, the Collé, the Some-Soude, the Grand-Morin, and the Petit-Morin. The north-east of the department is drained by the AISNE; the north and north-west by the Suippe and the Vesle, feeders of the Aisne; the south is skirted by the Seine, and crossed by the AUBE, both of which rivers are navigable in this department. By the Saulx, the Ornain, the Planche-Coulon canal from the Ornain to the Chée, the Chée, and the Revigny canal, barges ply between the Marne and Bar-le-Duc, in the department of Meuse. The department is crossed by 8 royal, 15 departmental, and a great number of parish-roads; it is also traversed by the Paris-Strasburg railway now in course of construction, from which a branch runs N. uniting Château-Thierry to Reims.

The climate is temperate and the air pure, except along the eastern and western borders of the department, where in the low, rich, and sometimes marshy bottoms fogs are not unfrequent at certain seasons of the year. The common bread stuffs are grown; rye and oats in quantity more than enough for the consumption. Fruit-trees are extensively cultivated in the arrondissement of Sainte-Ménéhould; that of Châlons is famous for its melons; other crops are cow-cabbage, onions, which are grown in great quantities, artichokes, &c. The department contains several large forests; and within the last 20 years a considerable portion of the shallow chalky soil above mentioned has been planted with pines. Along the Marne, the Aisne, the Aube, and the Seine, there is some fine grass land, and a good deal of hay is made.

But the vine for the production of the famous Champagne wines is the chief object of the landholder's care all through the department, more especially in the arrondissement of Reims and Épernay, wherein the white wines of Sillery, Aï, Mareuil, Pierry, Épernay, and Dizy; and the pink wines of Verzenay, Verzy, Bouzy, Taissy, Cumières, Aï, Hautvilliers, Mareuil, Dizy, and Pierry, all of the first class, differing and distinguishable from one another by certain inexpressible elements of excellence, are produced from the hungry chalky soil on which little else than the vine bush will grow. The excellent qualities of the Champagne wines are owing however not wholly to the peculiarity of the soil, but in a great degree also to the unremitting care of the growers in the selection and management of their vines, and in the manipulation of the wines, which experience teaches them to make so as to suit the different palates of the lovers of Champagne in the various countries of the world. A curious fact is that the best white Champagne wines are made from black grapes. These are suffered to remain on the vine till they attain perfect maturity; when gathered they are put in the wine press, and the first pressings are set apart for wine of the first quality. The juice thus obtained is put into a tun, where it remains from 20 to 30 hours, after which time it is put into sulphured casks, and these are deposited in cool cellars. During the frosty weather the wine is transferred into other casks, and clarified by means of isinglass; this process is repeated once or twice (if necessary) after an interval of a fortnight each time. From the 20th to the 30th of March the bottling process for the effervescing wine begins, but this is sometimes delayed even to the end of May, as the greatest attention must be paid to the temperature of the air, otherwise the delicacy of the wine and its effervescence would be materially injured. The bottles are placed in deep cellars, so as to have the most equable temperature possible, in order to diminish the chance of loss by breakage, which however, when the wines become brisk in the autumn, often amounts to 20 per cent. The quantity of wine of all kinds made in the department annually amounts to about 15,400,000 gallons.

The domestic animals of the department are small and of bad breed; sheep are numerous; game is abundant; deer and wild boars are met with in the forests; the rivers and ponds yield abundance of fish; poultry is plentiful; bees are carefully tended.

Chalk, flint, millstone of the best quality, building-stone, potters' and brick clay, and turf, are the chief mineral productions.

The chief manufactures are woollen stuffs of all kinds, and cotton hosiery, which centre chiefly at Reims. There are also several tan-yards, dye-houses, paper-mills, glass-works, potteries, rope-walks, oil-mills, soaperies, and establishments for the making of Spanish white.

The most important article of commerce is Champagne wine, the great marts for which are Reims and Épernay. Other articles of trade are corn, flour, brandy, the articles previously named, together with timber, hides, and firewood, of

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which great quantities are sent for the supply of Paris. About 670 fairs are held in the year.

The department contains 2,019,015 acres, distributed among 176,402 proprietors, and into 1,540,836 parcels. Of this area 1,519,320 acres are more or less capable of cultivation; 95,025 acres are grass land; 45,701 acres are under vine culture; 231,106 are covered with woods and forests; 22,927 are laid out in nurseries, orchards, gardens, &c.; 41,913 acres consist of heath and moorland; 15,749 are covered with rivers, marshes, ponds, canals, &c.; and 46,776 acres are occupied by roads, streets, and buildings.

The department is divided into 5 arrondissements, which with their subdivisions and population are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Châlons-sur-Marne . .	5		52,498
Épernay . .	9	215	91,387
Reims . . .	10	181	134,883
Sainte-Ménéhould . .	3	82	36,404
Vitry-le-François . . .	5		52,137
Total . .	32	693	367,309

In the arrondissement of Châlons-sur-Marne, the chief town is CHALONS-SUR-MARNE, which is also the capital of the department. *Suippes*, an improving and well-built little town, of 2358 inhabitants, stands E.N.E, of Châlons, on the Suippe, a feeder of the Aisne, and has important manufactures of coarse woollens, woollen yarn, and leather, besides dye-houses, and a considerable trade in corn, cattle, hemp, and wool. *Vertus*, an ill-built town at the foot of a high vine-clad hill, W. by S. from Châlons, has 2200 inhabitants.

Of the arrondissement of Épernay, the chief town *E'pernay* stands in a rich vine district, near the left bank of the river Marne, which is here crossed by a bridge of 7 arches. The town is well-built, clean, and well-paved. It has tribunals of first instance and of commerce, a college, and about 6000 inhabitants, who manufacture hosiery, pottery, refined sugar, and leather; and trade largely in bottles, corks, wire, champagne wines, &c. *Dormans*, a small town W. of Épernay, on the left bank of the Marne, has 2148 inhabitants, who send large quantities of wood and charcoal to Paris by the Marne. *Fère-Champenaise*, S. of Épernay, the scene of the defeat of Marshals Marmont and Mortier by the Austro-Russian army under Schwartzenberg (March 25, 1814), stands on the Pleurs, and has 2118 inhabitants. *Montmirail*, situated on a hill near the right bank of the Petit-Morin, a feeder of the Marne, has a population of 2545. Napoleon defeated a large force of Russians and Prussians here, Feb. 11, 1814. *Sézanne*, an ancient and well-built town, is situated on the slopes of a hill, partly in Brie, partly in Champagne, and has 4440 inhabitants, who manufacture coarse woollens, tiles, bricks, lime, pottery, flour, oil, and leather. Sézanne was formerly fortified, and stood several sieges; the site of its defences is now laid out in gardens and public walks.

In the arrondissement of Reims, the chief town is REIMS. *Ay*, or *Aï*, near the right bank of the Marne and nearly opposite to Épernay, has 3130 inhabitants, who are chiefly engaged in the culture of the vine, and in the distillation of brandy. *Fismes*, in the north-west of the department, on the left bank of the Vesle, is a well-built walled town, with 2366 inhabitants, who manufacture woollen cloth, and trade in flour, wine, hemp, wool, &c.

Of the arrondissement of Saint-Ménéhould, the chief town *Sainte-Ménéhould*, situated in a pretty, well-wooded country, on the Aisne, in the east of the department, has a tribunal of first instance, a college, and 4131 inhabitants, who manufacture hosiery, leather, and small wares. In the environs there are several iron forges, glass-works, and potteries.

The arrondissement of Vitry-le-François is named after its chief town *Vitry-le-François*, or *Vitry-Sur-Marne*, a well-built, fortified town on the right bank of the Marne, 20 miles S.E. from Châlons, and has a tribunal of first instance, a college, and 7449 inhabitants. The town is modern; it was founded in 1545 by François I., after the destruction of Vitry-en-Perthois, or Vitry-le-Brulé, by Charles V. The streets are wide, straight, clean, and provided with foot-pavements; the houses are mostly of wood; the supply of water is from 27 fountains, from which also streams run through all the streets. The central square, on one side of which is an unfinished church of large dimensions, is adorned with a handsome fountain, and planted with a double row of lime trees. The manufactures are hosiery, cotton yarn, oil; the chief trade is in corn, wool, wood, and charcoal.

The department, with the exception of the arrondissement of Reims, which, with the department of Ardennes, is included in the see of the archbishop of Reims, forms the see of the bishop of Châlons. It is comprised in the jurisdiction of the High Court and University Academy of Paris, and belongs to the second Military Division, of which Châlons is head-quarters. Under the monarchy it returned 6 members to the Chamber of Deputies; it now has 8 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1849; *Statistique de la France.*)

MARNE, HAUTE, a department in France formed out of the southern part of the province of Champagne, and of small portions of Bourgogne, the duchy of Bar, and Franche-Comté, is bounded N. by the departments of Marne and Meuse, E. by that of Vosges, S. by Haute-Saône and Côte d'Or, and W. by the department of Aube. Its greatest length is 78 miles, and the average width is 37 miles. The area is 2413 square miles, and the population in 1846 was 262,079, which gives 108·61 to the square mile, being 65·14 below the average per square mile for all France.

The department is mountainous. The plateau of Langres, which links the Cevennes to the

Vosges Mountains, and forms part of the watershed between the Mediterranean and the Atlantic, covers the greater part of the south of the department, and sends northwards numerous ramifications along both banks of the Marne. These mountains rise near Langres to about 2500 feet above the sea; they diminish in height as they advance northwards. The valleys extend mostly north and south. In the arrondissement of Vassy, in the north of the department, there are some fine valleys and extensive plains. Here and there all through the department, outlying hills, either singly or in groups, give variety to the surface. More than one-third of the department is covered with forests, in which oak, beech, ash, maple, birch, and poplar are the principal trees.

The principal rivers are—the MARNE and its feeders, and the MEUSE, which rises in the department, and flows northwards across the eastern boundary into the department of Vosges. The south-west of the department is drained by the AUBE and its feeder the Aujon; the Amance and the Vingeanne rise on the south-eastern side of the plateau of Langres, and flow to the Sâone. The Rognon, the Suize, and the Treire, all feeders of the Marne, have their whole length in this department; the Blaise, another considerable feeder of the Marne, rises, and has most of its length, in Haute-Marne. Except three or four miles along the Marne, below St.-Dizier, the department has no internal navigation. It is crossed by 6 royal and 8 departmental roads.

The climate is very healthy; the air is pure and keen in the mountains, where the winters are very cold. In many of the valleys, especially in those that open into the basin of the Saône, the temperature is warm and equable.

The common breadstuffs are produced in quantity sufficient for the consumption. Kitchen vegetables, pulse of all kinds, mustard, hemp, cherries, filberts, &c., are grown. The vine is extensively cultivated in favourable situations, and about 13,000,000 gallons of wine are made, two-thirds of which are consumed on the spot, and the rest is exported to Switzerland and to the departments of Vosges and Haut-Rhin. The milch cattle of the department are of good breed; horses and sheep are small; goats are numerous; poultry and game of all kinds are plentiful.

The department is rich in iron ore; several mines are worked; the metal is smelted and manufactured into bars, utensils, and tools in 114 furnaces and foundries, in which wood charcoal is the fuel exclusively used. Building-stone, marble, alabaster, gypsum, &c., are quarried. Marl, brick-earth, fuller's clay, and turf are dug. Besides ironmongery and cutlery, the industrial products include brandy, vinegar, cotton and woollen yarn, drugget, woollen stockings, leather gloves, cast-iron tubes, paper, leather, beer, &c. The commerce in the products before named, and in timber, planks, fire-wood, oak-staves, oil, honey, &c., is considerable. About 225 fairs are held annually.

The department contains 1,544,571 acres, distributed among 110,292 proprietors, and into 1,222,408 parcels. Of the whole area, 829,343 acres are capable of cultivation; 88,418 acres are grass land; 32,461 are under vines; 524,327 acres are covered with woods and forests; and 69,115 acres consist of heaths and moors.

The department is divided into three arrondissements, which, with their sub-divisions and population, are as follows :—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Chaumont . .	10	198	87,378
Langres . .	10	209	103,234
Vassy . . .	8	145	71,467
Total. . .	28	552	262,079

Of the arrondissement of Chaumont and of the whole department the chief town is *Chaumont-en-Bassigny*, which stands on a hill at the junction of the Marne and Suize, in 48° 6′ 47″ N. lat., 5° 8′ 19″ E. long., 150 miles S.E. from Paris, and has tribunals of first instance and of commerce, a college, and 6347 inhabitants. The town is pretty well built, with wide clean streets; some of them however are very steep. It still retains some portion of its old fortifications. The supply of water is from twelve wells and four fountains, to which last the waters of the Suize are raised by an hydraulic engine. The principal buildings are—the church of St.-Jean, the college buildings, the hospital, the remains of the castle of the counts of Champagne, and the town-hall, an elegant modern structure. The manufactures are woollen stockings, gloves, serge, drugget, common woollen cloth, cotton and woollen yarn, leather, beet-root sugar, &c. *Château-Villain*, 12 miles W. by S. from Chaumont, stands on the left bank of the Aujon, and has iron forges and smelting furnaces, and 2068 inhabitants. *Nogent-le-Roi*, 12 miles S. by E. from Chaumont, near the right bank of the Treire, is the centre of a considerable cutlery manufacture, and has 2979 inhabitants.

In the arrondissement of Langres, the chief town is LANGRES. *Bourbonne-les-Bains*, celebrated for its warm springs, is situated on the southern side of the plateau of Langres, and on the Apance, a feeder of the Sâone. It is frequented chiefly by persons troubled with paralysis and with gun-shot wounds, and has a military hospital with 545 beds, 40 of which are for officers. The regular season is from May to October; but the baths are frequented more or less during the whole year. *Fayl-Billot*, S.E. of Langres, has 2505 inhabitants. *Montigny-le-Roi*, a small town of 1300 inhabitants, deserves notice on account of its situation near the source of the Meuse.

Of the arrondissement of Vassy, the chief town, *Vassy*, is prettily situated on the right bank of the Blaise, 28 miles N. from Chaumont, and has a tribunal of first instance, a college, and 2841 inhabitants, who manufacture calico, drugget, ironmongery, pottery, and leather. There are several iron forges and smelting works near it. *Joinville*, situated on the Marne, at the foot of a hill, on the

summit of which formerly stood the castle of the Sires de Joinville, has several iron works, and 3196 inhabitants. The duke of Orléans, father of the ex-king of France, had the castle demolished in 1790; the church remained till 1792, when it was destroyed, with the tombs of the lords of Joinville and all the curious relics it contained. In 1841 such of the remains as had been preserved or recovered were solemnly deposited in the cemetery of the town, and a tomb, with a suitable inscription, was erected over them at the expense of Louis Philippe. Woollen hosiery, drugget, tartan, linen, woollen-yarn, and serge are manufactured in this town. *St.-Dizier*, a well-built town, with wide regular streets, stands on the right bank of the Marne, which here begins to be navigable at a distance of 9 miles N. from Vassy, and has a tribunal of commerce, a college, and 5705 inhabitants. The town-hall and the remains of an ancient castle are the most interesting structures in the town. Its chief industrial establishments are iron forges and foundries, boat-building yards, and cotton factories. There is also a considerable trade in planks, ship timber, and in wine casks.

The department forms the see of the bishop of Langres; is included in the jurisdiction of the High Court and University Academy of Dijon, and belongs to the 18th Military Division, of which Dijon is head quarters. Under the monarchy it returned 4 members to the Chamber of Deputies; it now has 5 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1849; *Statistique de la France.*)

MAROCCO, called by the natives Mogh'rib-el-acsà ('the farthest west'), or briefly Mogh'rib, whence the inhabitants are called Moghribins, is an empire in Northern Africa, which extends from S. to N. between 27° and 36° N. lat., the most northern districts forming the southern coast of the Straits of Gibraltar, and from E. to W. between 1° 20′ and 11° 30′ W. long. On the N. it borders on the Mediterranean, and on the N.W. and W. on the Atlantic Ocean, on the S. on the Sahara, and on the E. on Algiers. Its surface has been estimated at 274,000 square miles.

Surface and Rivers.—The surface of this extensive country is extremely diversified by mountains, hills, plains, and valleys. The Atlas traverses it in its greatest length. [Atlas.] The whole coast-line along the Mediterranean, which from Tawunt to Cape Spartel is about 320 miles, is high and rocky. Level tracts of inconsiderable extent occur at the mouths of the small rivers only. The elevated and rocky coast continues along the Atlantic nearly as far south as the mouth of the river El Kos. The country adjacent to the coast is rather hilly than mountainous, though a few rocky masses rise to 2500 feet. The river (wadi) El Kos traverses an immense plain called M'shiara-er-Rumla, which extends eastward to the ranges of the Lesser Atlas, and southward to the banks of the river Seboo. On its western border the sea has formed a range of sand-hills, by which several small rivers are prevented from reaching the ocean, and form along the shores two lakes, the smaller of which, Muley Buselham, is 5 miles long, and the larger, Murja Ras el Dowla, 20 miles long by one and a half broad. The range of sand-hills which separates these lakes from the sea is about 250 feet high. The harbours along this low coast are nearly filled up with sand, and can only be entered by small vessels.

The plains continue south of the Seeboo river to the banks of the Oom-er-begh, or Morbeya, and still farther south; but they gradually change their character, and their fertility greatly diminishes. A range of hills, rising between 500 and 1200 feet above the plains, divides them from the southern plain, which extends along the base of the Greater Atlas. The plain of Tarudant, which is the most southern, lies between the ranges of the Bebauan and Adrar mountains. It appears to be traversed nearly in the middle by a range of hills which divide it into two wide valleys. The countries east of Mount Adrar and south of the Greater Atlas are known under the names of Daraa, Tafilet, and Segelmesa, and are parts of the Bilud-ul-Gerid, or 'country of palms.'

The river Muluya, which rises at or near the southern extremity of the Lesser Atlas, and runs northward into the Mediterranean Sea, has a course of about 400 miles. It is the only considerable river in Marocco which falls into the Mediterranean. Seven rivers fall into the Atlantic Ocean; viz. El Kos, Bu Regreb, Oom-er-begh, Tensift, Sus, Draha, and Seboo: they have lengths from 100 to 300 miles. From the southern declivity of Mount Atlas descend three other rivers the Fileli, Ziz, and Ghir.

Climate and Productions.—The climate is not so hot as might be expected from the position of this country. A great part of the empire is subject to the alternation of the sea and land breezes, and those districts which lie beyond their reach are cooled to some extent by the winds which blow from the mountains. Frost and snow only occur on the mountains. The seasons are divided into the dry and wet. The wet season happens in our winter. Besides wheat and barley, which are extensively raised in most of the districts of the plains, rice, Indian corn, and holcus sorghum or dhurra, are cultivated. Other objects of cultivation are cotton, tobacco, sesamum, hemp, saffron, henna, and different kinds of beans and peas. The plantations of date-trees, olive-trees, and almond trees are very extensive. The fruit-trees of southern Europe are also common, especially the fig and the pomegranate. Forest trees are numerous on the northern slope of the Atlas.

Domestic animals of every kind are numerous. The horses are distinguished by their beauty; the sheep produce a wool not inferior to any for softness, fineness, and whiteness; sheep and goats are more numerous than any other domestic animals. Goat-skins constitute one of the most important articles of export. Cows, asses, mules and camels are also reared in considerable number. In the large uncultivated tracts wild animals abound, as lions, panthers, hyænas, wolves, and several species of antelopes and deer, as well as monkeys and wild boars. Ostriches, cranes, storks and locusts also abound.

The mineral wealth of Marocco is very imperfectly known, but is supposed to include gold, silver, copper, lead, iron, rock salt, and fuller's earth.

Inhabitants.—The population of this empire is estimated at from 5,000,000 to 14,000,000 by different authorities: no certain data exist on this subject. They consist of various races, of which the following are the chief.

The *Amazirghis*, or *Mazirghis* [BERBERS], are the most ancient inhabitants of Northern Africa, and one of the most widely spread nations of that continent. The Amazirghis in Marocco are divided into Berbers and Shelluhs. The *Berbers* occupy exclusively the mountain region which extends along the Mediterranean. The *Shelluhs* occupy the Greater Atlas and its great branches Mount Bebauan and Mount Adrar. The *Moors* are the most numerous of the nations that inhabit Marocco. They are the only nation of Marocco with which the Europeans have an immediate intercourse, and they are the principal inhabitants of the towns; they fill the high offices of government, and form the military class. [MOORS.] The *Arabs* are the descendants of those who emigrated at the time when the Mohammedan religion was diffused from the Hejaz, Yemen, and Hadramaut. A few families live in the towns, but the Beduins are dispersed over the plains. The *Jews* are intermixed among all these nations. They are very numerous in the seaports and commercial towns. The *Negroes* who are imported as slaves, frequently obtain their liberty; and as they are distinguished by fidelity, the emperor has thought it expedient to form his body-guard of them.

Political Divisions and Towns.—The empire of Marocco is composed of the two kingdoms of Fez and Marocco, of which the former occupies the countries north of the river Oom-er-begh and the basin of the river Muluya; the kingdom of Marocco comprehends the remainder, with the exception of the countries south of the Greater Atlas and Mount Bebauan, which are considered as a separate kingdom, called that of Tafilet. The whole country is divided into thirty-two governments, of which fifteen belong to Fez, fifteen to Marocco; and the countries of Draha, Tafilet, and Segelmesa are divided into two other governments.

Along the coast of the Mediterranean the Spaniards possess Melilla, near Ras-ul-dir, or Cape Tres Forcas, and farther westward Alhucemas and Peñon de Velez, three small fortresses, which have no communication with the interior.

Not far from the Straits of Gibraltar is *Tetuan*, built on the declivity of a hill: it is a prosperous commercial town. Near the eastern entrance of the Straits of Gibraltar is the Spanish town of *Ceuta* [CEUTA], and near the western the town of *Tangier*, where the European consuls-general reside. Tangier is built on a hill, near a spacious bay, and has some wide and good streets, with several Jewish synagogues and a Roman Catholic church. Along the Atlantic, from north to south, are the following towns:—*El Araish* or *Larash*, at the mouth of the river El Kos, having a good harbour. *Sla*, or *Salé*, and *Rabatt*, are separated from each other by the river Bu Regreb, which forms their common harbour; the former is a decayed town, but the latter is flourishing. *Saffi*, or *Asafi*, farther south, not far from Cape Cantin, is between two hills in a valley, and is subject to inundations. It has suffered from the rise of *Mogadore*, or *Suera*, the port of the town of Marocco, which lies on the sea-shore between Cape Cantin and Cape Gher. Mogadore is built on a low shore, consisting of moving sand, which extends from 5 to 15 miles inland, where a fertile country begins. It is regularly built, the streets being straight, but somewhat narrow. The Europeans settled here have erected several large buildings in the African style. The town is divided into two parts, one of which is called the Fortress, and contains the custom-house, the palace of the Pasha, the other public buildings, and the houses of Europeans; the other part is only inhabited by Jews. The trade of Mogadore is considerable. *Agadir*, or *Santa Cruz*, farther south, has a good harbour. In the interior are the towns of *Teza* and *Al Kassar*.

Fez, or *Fas*, the most industrious and commercial town of the empire, is situated in a valley which is drained by one of the upper branches of the Seboo river. It contains upwards of 100 mosques and seven public schools with numerous pupils. The imperial palace, with the buildings and gardens annexed to it, occupies a great space. The number of persons employed in manufactures is considerable. Every trade is carried on in a separate street; generally only one kind of goods is sold in each shop. The commerce of this town with the seaports is very great. The streets are narrow, and, owing to the great height of the houses, also dark: there are numerous extensive caravansaries, or public inns, where the travelling merchants find lodgings.

Mekinez, or *Miknas*, west of Fez, is a large manufacturing town, containing an imperial palace. *Tefza* and *Demnet* are considerable manufacturing and commercial towns.

Marocco, the capital of the empire, and the residence of the sultan, is situated on level ground, four miles south of the river Tensift, and is surrounded by a strong wall thirty feet high, with square turrets at every fifty paces. The streets are narrow and irregular. Several open places are used as market-places. The houses, which are only of one story, have flat roofs and terraces. Large canals, which convey the water of the river Tensift to the city, surround it, and some of them are ten or twelve feet deep. On the south of the town, but without the walls, is the imperial palace, a wall of a quadrangular form, inclosing a space about 1500 yards long by 600 wide. The inclosed space is divided into squares, laid out in gardens, round which are detached pavilions, forming the imperial residences. There are nineteen mosques, two colleges or medrasses, and one hospital in this town. The principal mosque, El Kontubía, is distinguished by a lofty tower, 220 feet high, a masterpiece of Arabic architecture. There is a fine bazaar, and a few manufactures.

Among the remaining towns of the empire are *Tarudant*, *Tedsi*, *Tagavost*, *Nun*, *Tafilet*, and *Tatta*.

All estimates of the population of these several towns are so discordant that it is useless to state them.

The Moors send their children to school at the age of six years. The elementary schools, which are very numerous, both in the towns and in the country, are either private or public establishments. The former are called *mesid*, or *mektib*, and the latter *jamà*. In these schools reading, writing, and correct pronunciation are taught; the children also learn by heart some passages of the Koran. In the colleges they are instructed in grammar, theology, logic, rhetoric, poetry, arithmetic, geometry, astrology, and medicine.

Manufactures and Commerce.—As the inhabitants dress chiefly in wool, the manufacture of woollen cloth is general, but the material is usually coarse. In some places however there are manufactories on a large scale, which supply articles of export. A few silk goods are also woven. The inhabitants of Fez are distinguished as goldsmiths, jewellers, and cutters of precious stones; many of them are also occupied in making Marocco leather, and different kinds of earthenware. Tanning and leather dressing are carried on extensively; and carpet weaving is also much practised.

The Moghribins carry on a very active commerce with Soudan or the interior of Africa, and with Egypt and Arabia, by caravans, and with several parts of Europe by sea. From Timbuctoo, as a central point, the merchants traverse the adjacent countries, exchanging their goods for those of Soudan. The caravans which go to Mecca are chiefly composed of pilgrims, and are much more numerous than the trading caravans. They depart only once in the year, and follow two routes.

European vessels visit the harbours of Tetuan, Rabatt, Saffi, and Mogadore, and export the produce of the empire to Italy, France, Spain, England, and Holland, bringing in return the produce of European and other countries.

Government.—The government is absolutely despotic, even more so than in the Turkish empire; the people are much oppressed, and the Christian merchants exposed to great losses by capricious ordinances.

(Jackson's *History of Marocco* and *Shabeeny;* Washington, in the *London Geographical Journal;* Lemprière's *Tour from Gibraltar to Tangier*, &c.; Caillé's *Travels through Central Africa*, &c.; Semple's *Second Tour in Spain*, &c.)

MARONITES, the name of a community of Christians belonging to the Western or Roman church, and living on Mount Lebanon. They are neighbours of and allied to and in some places mixed with the Druses, and, like them, independent, in great measure, of the Turkish power. [DRUSES.] The Maronites occupy the valleys and fastnesses of the principal ridge of Lebanon east of Beyroot and Tripoli, and they extend inland as far as the Bekaa, or plain between the Libanus and Anti-Libanus. The town of Zhaklé, in the valley of Bekaa, contains between ten and twelve thousand inhabitants, chiefly Maronites. But the tract of country in which the great bulk of the Maronites reside is called Kesrouan. It extends along the ridge of Libanus from the Nahr el Kelb, a stream which enters the sea 12 miles north of Beyroot, to the Nahr el Kebir, which enters the sea north of Tripoli, near the island of Ruad, the ancient Aradus, on which side the Maronites border on the Nosaïris, or Ansarieh, who extend to the northward towards Latakieh, and the Ismaelians, who live farther inland, near the banks of the Orontes. [ISMAELITES.] In their internal concerns the Maronites are governed by their own sheiks, of whom there is one in every village, from whose decision there is an appeal to the bishops, who have great authority; and in some cases to the emir of the Druses, and his divan, or council. The clergy are very numerous; the secular parish clergy are married, as in the Greek church; but the regular clergy, who are said to amount to 20,000, and are distributed among about 200 convents, follow the rule of St. Anthony, and are bound by vows of chastity and obedience. Every convent is a farm. The convents are under the jurisdiction of bishops, of whom there is one in every large village. The bishops are under the obligation of celibacy. The bishops collectively elect the patriarch, who is confirmed by the pope, and who resides at the convent of Kanobin, in a valley of the Libanus, south-east of Tripoli.

The Maronites derive their name from a monk of the name of Maro, who, in the fifth century, collected a number of followers, and founded several convents in these mountains. When the Monothelite heresy prevailed in the East in the seventh century, many Christians who did not embrace its tenets took refuge in the fastnesses of Libanus, around the convents, and thus the name of Maronites was assumed by the population of the mountains.

The Maronite population is said to be above 200,000 individuals, and to contain between thirty and forty thousand men fit for military service. Their language is Arabic, and by their appearance and habits they belong to the Arabian race.

MARO'T, CLE'MENT, born at Cahors in 1495, entered the service of the Duchess of Alençon as page. He afterwards followed Francis I to Italy, and was wounded and taken prisoner at the battle of Pavia. He experienced a succession of good and evil fortune, and remained attached to the French court. He is known for his 'Enfer,' a satire, and his 'Roman de la Rose,' and various other poetical works, which possess the simplicity of the age united with grace and poetical fancy. He left a natural son who also wrote poetry. He died at Turin in 1544. His works, together with those of his son, were published at Lyon in 4 vols 4to., 1731.

MARPURG, FRIEDRICH WILHELM, a very eminent writer on the theory of music, was born in 1718, at Seehausen in Prussia, and died in 1795. His 'Manual of Harmony and Composition' is highly esteemed by musicians.

MARQUESAS ISLANDS are situated in the Pacific, and extend about 200 miles in a north-west and south-east direction, between 10° 30′ and 7° 50′ S. lat., and 139° and 141° W. long.

wide channel divides them into two groups, of which the south-eastern contains five, and the north-western eight islands. The former were discovered by Neyra in 1595; the latter, having been discovered by the Americans in 1797, are also called Washington's Islands.

The largest islands of the southern group are Santa Dominica, or Hiwaoa, Santa Christina, or Tahuata, and Hood's Island, or Tiboa. The principal islands of the northern group are, Noukahivah, Nouhivah, Uahuga, and Uapoa, or Roapoa. Noukahivah, the largest, is nearly 20 miles long from south-east to north-west, and 70 miles in circumference.

An elevated ridge of rocky mountains traverses each island lengthways, and in the larger one rises to an elevation of 2000 or 3000 feet. The mountains have on both sides high offsets, which extend to the shores of the sea, and thus divide the low land along the shores into valleys. The mountains are rugged, and the coast is rocky, but the valleys are fertile. The islands afford several excellent harbours. The climate is rather warm, but healthy. The inhabitants cultivate fruits and tropical plants. Land animals are few, but fish is abundant.

The inhabitants belong to the same race that peopled the Society and Sandwich Islands, of which their language and bodily conformation offer undoubted proof. Their complexion is of a copper-colour. They have carried the art of tatooing the body to a greater degree of perfection than any nation, the bodies of distinguished persons being covered all over with regular figures of a very tasteful pattern. The people are cannibals.

MARQUIS, a title of honour in England. Persons who have this title are the second in the five orders of English nobility: dukes are the first. The younger sons of marquises are addressed as 'my lord,' as Lord Henry Petty, Lord John Thynne. [MARCHES.]

There were no English marquises before the reign of Richard II. In the reign of Edward III. a foreign marquis, the Marquis of Juliers, was made an English peer with the title of Earl of Cambridge, and this circumstance probably suggested to King Richard the introduction of this new order of nobility. The person on whom it was conferred was his favourite Robert de Vere, earl of Oxford, who was created Duke of Ireland and Marquis of Dublin in 1385. But three years after he was attainted and his honours forfeited.

The only marquis who sits in the House of Peers as a marquis, and whose title dates before the reign of George III., is the Marquis of Winchester. The other marquisates are all of recent creation, though most of them are old peerages under inferior titles.

The title seems not to have been known in Scotland till 1599, when the marquises of Huntley and Hamilton were created.

MARRIAGE is an agreement by which a man and a woman enter into a mutual engagement, in the form prescribed by the law of the country in which they reside, to live together as husband and wife during the remainder of their lives.

Marriage is treated as a civil contract even by those Christians who regard it as a sacrament, and as typical of the union between Christ and the church. The religious character of the transaction does not arise until there has been a complete civil contract, binding according to the law of the country in which the marriage is contracted. The authority of the sovereign power in regulating and prohibiting marriages is therefore not affected by the superinduced religious character.

Among Protestants marriage has ceased to be regarded as a sacrament, yet in most Protestant countries the entrance into the marriage state is accompanied with religious observances. These are not however essential to a valid marriage any further than the law may have annexed them to and incorporated them with the civil contract.

In England, marriage by mere consent of parties, until the passing of the Marriage Act in 1753, constituted a binding engagement; though if application were made to the ecclesiastical courts for letters of administration, &c., under a title derived through such irregular marriage, those courts sometimes showed their resentment of the irregularity by refusing their assistance, more especially where the non-compliance with the usual formalities could be traced to disaffection to the Established Church. What the formalities required by the Church before the Marriage Acts were, it is now immaterial to consider. Such of them as are not incorporated into any of the Marriage Acts are now of no force.

To constitute a valid marriage, as well before as since the Marriage Acts, it is necessary, 1st, that there should be two persons capable of standing in the relation of husband and wife to each other; 2ndly, that they should be willing to stand in that relation; and 3rdly, that they should have contracted with one another to stand in that relation.

1. The capacity of standing in the relation of husband and wife implies that at the time of the contract there should be no natural or legal disability. Total and permanent disability on either side to consummate marriage will render the contract void. Temporary disability from disease does not affect the validity of a marriage. Temporary disability from defect of age does not invalidate the marriage, but it leaves the party or parties at liberty to avoid or to confirm such premature union on attaining the age of consent, which for males is 14, and for females 12. A person who is already married is under a legal disability to contract a second marriage whilst the first wife or husband is alive.

Consanguinity within certain degrees, and affinity also, is a legal impediment to marriage. The degree of nearness which shall disable parties from uniting in marriage varies in different countries, and has varied at different periods in our own. [AFFINITY.]

The impediment to marriage arising out of consanguinity applies in the same degree to illegitimate as to legitimate consanguinity, and the impediment resulting from affinity is created by illicit connection as well as by marriage. The Council of Trent restricted the impediment of

affinity arising out of illicit connection to the second degree.

2. Each party must have the will to contract marriage with the other. An idiot therefore, who cannot understand the nature of the conjugal relation, is incapable of contracting marriage; and also a lunatic, except during a lucid interval. But, however absurd it may appear, children are presumed to have sufficient intelligence to understand the nature of the marriage engagement at seven; and though the contract is not absolutely binding upon them until they reach the age of consent, still the marriage of a child above the age of seven would prevent its forming a second marriage until the age of consent, as until that age it cannot dissent from the first marriage.

3. There must be an actual contract of marriage. This, at common law, might be by words of present contract, which would, without more, constitute a perfect marriage,—or by words of future contract, followed by cohabitation.

The unlimited freedom of marriage was first limited in England by the Marriage Act of 1753 (26 Geo. II. c. 33), the principal provisions of which form the basis of the present law.

The restrictions upon the common-law freedom of marriage are now embodied in two statutes.

The 4 Geo. IV. c. 76, contains numerous provisions:—Banns of matrimony are to be published in the church, or a public chapel in which banns are allowed to be published, of the parish or chapelry wherein each of the parties dwells, immediately after the second lesson of morning service, or of evening service if there be no morning service, upon three Sundays preceding the solemnization (s. 2). No licence of marriage (that is, dispensation from the obligation to publish banns) is to be granted to solemnize marriage in any church or chapel not belonging to the parish or chapelry within which the usual place of abode of one of the parties has been for fifteen days immediately before the granting of the licence (s. 10). For the other provisions the act should be consulted.

The 6 & 7 Wm. IV. c. 85, was passed chiefly in favour of those who scrupled at joining in the services of the Established Church; and it contains numerous provisions for this purpose.

Persons who object to marry in a registered place of worship may, after due notice and certificate issued, according to the provisions of this act, contract and solemnize marriage at the office of the superintendent registrar, and in his presence and in that of some registrar of the district, and of two witnesses.

These statutes do not extend to marriages contracted out of England, or to marriages of the royal family, which are regulated by a particular statute, 12 Geo. III. c. 11.

In August, 1844, an act was passed (7 & 8 Vict. c. 81) relating to marriages in Ireland, and for registering such marriages, which came into operation April 1st, 1845. It establishes a system very nearly similar to that which exists in England and Wales under 6 & 7 Wm. IV. c. 85.

Generally speaking, a marriage, valid according to the law of the country in which it was contracted, is valid in every other country. This is the general rule of law among European nations and nations of European origin.

MARRIAGE in Scotland is a mere consensual contract, which admits of being proved like any other contract. Marriages are however distinguished into regular and clandestine. For the former a certificate that the banns have been three times proclaimed in the parish church of both parties is necessary. All marriages deficient in this respect are called clandestine. The *celebration* of a clandestine marriage subjects all the parties to penalties; but if there be no celebration but a mere attestation by a justice of peace or any other person not a clergyman, that parties have declared each other in his presence man and wife, this, if supported by other circumstances, is evidence of the contract. Clandestine marriages are nearly unknown among the respectable inhabitants of Scotland. A bill is now (June 1849) in parliament the object of which is to prevent such clandestine marriages. By the 4 & 5 Wm. IV. c. 28, regular marriages may be solemnized by the clergy of any religious persuasion. The privilege was previously confined to the established and licensed episcopalian clergy. A *promise* of marriage, proved by writing or the oath of the promiser, if followed by cohabitation, constitutes marriage in Scotland.

MARRIAGE, ROMAN. The right conception of a Roman marriage, and of its legal consequences, is essential to enable us to approximate to a right understanding of the old Roman polity. It is also an important element in the history of the condition of women in civilized Europe.

Children were in the power of their father only when they were the offspring of a legal marriage (justæ nuptiæ), or were adopted in due form. No particular ceremony was necessary for marriage; legal capacity, consent, and cohabitation were sufficient. But in order that the wife might become a member of the husband's family, there must be either Usus, Confarreatio, or Coemptio.

A woman who lived for one year with a man without interruption as his wife, came by virtue of this cohabitation (usus) into his hand (in manum). The Twelve Tables provided that if the wife wished to avoid the legal effect of this cohabitation, it was only necessary to absent herself from her husband for three nights during the year, which would be a sufficient legal interruption to the usus. In the time of Gaius this part of the old law had been partly abolished by enactments, and had partly fallen into disuse.

The Confarreatio, so called from the use of a loaf of bread on the occasion, appears to have been of the nature of a religious ceremony, and it existed in the time of Gaius. The form of a divorce that applied to a marriage by Confarreation was called Diffareation (diffareatio).

The Coemptio was, in form, a sale (mancipatio) before five witnesses.

When a wife came into the hand of her husband she was properly called Mater Familiæ; when she did not come into the hand of her husband, she was simply Uxor (Cicero, 'Topica,' 3).

The 'conventio in manum,' or coming into the hand of the husband, made the wife a part of the husband's family, and her personality, like that of the husband's children, was merged in that of her husband. It followed that if she had property, it became her husband's property. As the wife in manu was in the place of a daughter to her husband and a sister to her children, she inherited, in case of the husband's intestacy, like one of her children. (Gaius, iii. 14.) If there was no conventio in manum, the wife still belonged to her former family, and the husband had no power over her property, except that which he received as Dos, or marriage portion.

MARROW, or MEDULLA, is the fat contained in the osseous tubes and cells of the bones. [BONE.] Spinal Marrow and Medulla Spinalis are names sometimes applied to the spinal chord.

MARRU'BIUM VULGA'RE (White Horehound), a biennial or perennial herbaceous plant, common by roadsides, the officinal part of which is the leaves. These are to be collected without the stalks. They are of a whitish-gray woolly appearance, possessed of a faint odour, which becomes less by drying, and a bitter sharp taste. Their chief constituents are a bitter extractive, with a volatile oil, and probably some astringent matter. The plant is of little real use.

MARS, or MAVORS (called *Mamers* in the Oscan language), the god of war among the Romans, generally considered as corresponding to the Greek *Ares*. He was worshipped in peace under the name of Quirinus, and in war under that of Gradivus. According to a principle in Roman mythology, by which a male and a female deity are supposed to preside over the same object of fear or desire, the Romans had a goddess of war called BELLONA.

The first month (Martius) of the old Roman year, which consisted of ten months only, derived its name from this god.

Mars is generally represented with a beard, but in other respects like the Greek Ares. For the Greek god of war, see ARES.

MARS, the planet which comes next to the earth, in order of distance from the sun, is a brilliant star of a slightly red tint. On examination by a telescope, this colour is found to belong to parts of the surface of the planet which have been conjectured to be land; the rest, which appears somewhat green, being supposed to be sea. Certain white spots, which appear at each pole after the winter of its hemisphere, and disappear during its summer, have been conjectured to be snow. The apparent diameter of Mars varies from 3″.6 to 18″.28, being 6″.29 when the planet is at its mean distance from the earth. The real diameter is .517 of that of the earth, or about 4100 miles. Its bulk is .1386 of that of the earth, and its mass is .0000003927 of that of the sun, or about the 2546000th part.

The planet revolves on its axis in $24^h\,39^m\,21^s.3$, and the axis is inclined to the ecliptic 30° 18′ 10″.8. Its light and heat are 43 per cent. of those of the earth. The semiaxis major of its orbit is 1.5236923, that of the earth being assumed as the unit.

MARSA'LA, a town at the western extremity of Sicily, which was built by the Saracens, contains about 10,000 inhabitants, and belongs to the intendenza, or province, of Trapani. The country around produces very good white wine, which is exported to Malta and England. The harbour is almost choked up, but there is good anchorage sheltered by an island off the coast.

MARSDEN, WILLIAM, a distinguished Oriental scholar, was born in Dublin, November 16, 1754. Early in life he entered the service of the East India Company, and was stationed at Bencoolen in Sumatra, where he remained about eight years, applying himself in the leisure afforded from his official duties to the acquisition of the native languages and knowledge of the country. He then returned to England, and in 1782 published his 'History of Sumatra.' In 1795 he was appointed under secretary and subsequently chief secretary of the British Board of Admiralty, the duties of which offices he assiduously discharged for 12 years, when his health failing, he retired on a pension. In 1812 he published his 'Grammar and Dictionary of the Malay Language.' The two works we have mentioned have already been considered highly valuable contributions to our knowledge of the East, as is also his 'Essay on the Polynesian or East Insular Languages.' Mr. Marsden died of apoplexy in 1836. His valuable collection of coins and medals he gave prior to his death to the British Museum, and his library of books and Oriental MSS. to the newly founded King's College.

MARSEILLE (the Roman *Massilia*), a seaport and city in France, capital of the department of Bouches-du-Rhône, is situated on the coast of the Mediterranean about 408 miles S.S.W. from Paris, in 43° 17′ N. lat., 5° 22′ E. long., and has a population of 154,035. It is the chief port of the Mediterranean; and the steam-packet station for Italy, the Peninsula, and the East. A railway is in course of construction direct from Paris, through Dijon, Lyon, and Avignon, to Marseille. At present the line is open only from Marseille to Avignon. It has steam-boat communication with all the chief ports in the Mediterranean. Marseille gives title to a bishop, whose diocese comprehends the town and the arrondissement; it is also the head-quarters of the 8th Military Division.

The city of Marseille is built round an inlet of the sea, which runs eastward into the heart of the town and forms the harbour. The old town occupies a triangular point north of the harbour. The port is half a mile long and a quarter of a mile broad, and will give shelter to 1200 vessels. The harbour is safe; but its mouth is narrow, and it is inaccessible from the east. The port is defended by the cross-fire from the batteries of Fort St.-Nicholas and the tower of St.-Jean.

The immediate site of the town is a rich valley inclosed on the land side by hills, of which the highest is that of Notre-Dame-de-la-Garde. The entrance by the Paris road is a fine broad street, to the east of which is the old own. The streets of the old town are for the most part

narrow, and the houses high, irregular and massive. It contains numerous squares of vast magnitude: among others the Place-Neuve and Place des-Grand-Carmes. The new town consists of wide handsome streets, the chief of which is the Rue de Cannebière. On entering the town by the Port D'Aix the perspective is very fine—a broad straight street, lined with handsome houses, commanding a view of the port, and traversing the town from north to south. There are many promenades; but the most popular are the Esplanade de la Tourette, le Boulevard des Dames, and the spacious quays which surround the harbour. Many handsome fountains add to the beauty of the town, and give a relief to the monotonous regularity of the streets. The most remarkable public building is the town-hall, built by the architect Puget, which faces the harbour; and the most ancient church is that of La-Major; which has however been so altered and repaired, that it has generally the appearance of a modern edifice. It contains an altar with a bas-relief of the eleventh century. Beyond a few pieces of ancient sculpture, and the remains of one or two ancient monasteries, Marseille is singularly deficient in external evidence of its remote origin. The only modern building deserving of notice is the Hôtel de la Prefecture in the new town: it is a handsome and elegant edifice. Marseille has a custom-house, a stamp-office, an exchange, a board of trade, a spacious market-house, a lazaretto north of the town—one of the finest and best managed in the world—a mint, two theatres, a commercial court, a subordinate justice court, a council of Prud'hommes, an observatory, an arsenal, and other public institutions; besides many literary, scientific, and charitable societies. The Catholic churches are twenty in number; there are also a Protestant church, and a synagogue.

Marseille depends entirely upon its commerce, which is extensive; and, since the conquest of Algeria by the French, has been rapidly on the increase. Within the last few years an artificial basin has been made in the roadstead near Marseille by the construction of a dyke between the small fortified islands of Ratonneau and Pomègue, in which vessels of the line may anchor with perfect safety, and on the shores of which shipbuilding is extensively carried on. This basin is called Port-Dieu-Donné, and bids fair to be a most flourishing place.

The number of vessels which enter the port of Marseille annually is estimated at 5000 or 6000; and the custom-house and other dues collected exceed 1,100,000*l.* annually; and the municipal revenue is about 110,000*l.* The French trade with the Levant is entirely carried on from Marseille. The chief imports are of raw cotton, sugar, dye-woods, and divers articles from the Levant; exports, of wines, brandy, corn, dried fruits, oil, soap, hosiery, damask and other linens, woollens, silks, leather, hides, &c. The local manufactures consist of soap, morocco and other leather, glass, porcelain, hats, gunpowder, alum, sulphur, vitriol, and cutlery. The refining of sugar and salt, calico printing, the distillation of brandy, essences, and liqueurs, cork-cutting, and the preparation of anchovies, dried fruits, olives and wine for exportation, are carried on.

The town of Marseille has undergone many changes. Founded by the Phocæans (600 B.C.) under the name Massalia, it fell into the hands of the Romans under Cæsar, but retained its original aristocratic constitution. It subsequently became the prey of Burgundians, Visigoths, and Franks. The Marseillais were active in the Crusades, and at the time carried on extensive commercial intercourse with the East. In the 13th century they organised themselves into a Municipal Republic; but they were soon after deprived of many of their privileges by Charles of Anjou. The Marseillais adhered to the house of Anjou, and their town was burnt and sacked, in consequence, by the king of Aragon, A.D. 1480. Upon the death of Charles, Count of Maine, Marseille came directly under the government of the French crown, to which it has ever since remained subject.

MARSHAL (French, *maréchal*), a term which, in its origin, meant simply a groom or manager of horses. One of the principal officers of state in England is the king's marshal, which office is now held hereditarily by the Duke of Norfolk, who is said to have the office of marshal of England, and also an honour in respect of which he is earl-marshal. This office was executed in time of war in the king's army; in time of peace, in the aula regis, or king's great court. Upon the division of the aula regis the marshal appointed deputies in the new courts. In the King's Bench the marshal's deputy was called the marshal of the marshalsea of the king's court, or marshal of the King's Bench. In the Exchequer, the deputy was marshal of the Exchequer, or clerk of the marshalsea of the Exchequer. The duty of the acting marshal is regularly to attend the court, and to take into his custody all persons committed to his custody by the court.

Besides the earl-marshal, there is a knight-marshal, or marshal of the king's household.

MARSHALL, JOHN, Chief Justice of the United States of North America, was born in Fauquier County, Virginia, September 24, 1755. He received a little instruction in Latin and Greek, but went through no regular course of education, and was never at any college. He served in the American war of Independence, and in 1777 was promoted to the rank of captain. He was present at the battles of Brandywine, Germantown, and Monmouth. Marshall, having applied himself to the study of the law, was admitted to the bar in 1780, and in 1781 resigned his commission in the army. He now devoted himself to the law, and rose rapidly to great distinction.

Marshall was a member of the Virginia Convention for the ratification of the Constitution of the United States, and both then as well as subsequently in the Virginia legislature, distinguished himself by his judgment and eloquence. In 1799 he became a member of Congress, and on the 13th of May, 1800, he was appointed secretary of state. On the 31st January, 1801, he succeeded John Jay as chief justice of the United States, and he discharged his duties with great ability

and integrity. He died July 6, 1835, at Philadelphia.

Judge Marshall was the author of the 'Life of Washington,' originally published in London, in 5 vols. 4to., the first volume in 1804, the 5th in 1807. Marshall published a second edition of the work in 1832, compressed into two volumes, and greatly improved.

As a judge, it is admitted that he was one of the most distinguished that America has produced.

MARSHALSEA. In the marshalsea of the king's household there are two courts of record :— 1. The original court of the marshalsea is a court of record to hear and determine causes between the servants of the king's household and others within the verge, that is, within a circle of twelve miles round the king's palace, with a jurisdiction of pleas of trespass where either party is one of the king's servants. 2. The palace-court was erected by letters patent, 6 Charles I., confirmed by Charles II., and has authority to try all personal actions between party and party, though neither of them be of the king's household, provided they arise within twelve miles round Whitehall. The judges of this court are the steward of the king's household and knight-marshal; but the court is, in fact, held before a barrister deputed by the knight-marshal. The palace-court is held once a week in Scotland Yard, and causes are here brought to trial in four or five court-days, unless they are of sufficient magnitude or importance to induce either party to remove it into one of the superior courts. A writ of error lies from both courts into the court of King's Bench.

MARSHAM, SIR JOHN, born 1602, died 1685. He was a lawyer, and a supporter of the cause of Charles I. He is chiefly known for his 'Canon Chronicus, Ægyptiacus, Ebraicus, Græcus,' published in 1672, being an enlargement of a work on the same subject published in 1649, entitled by him 'Diatribe Chronologica.' Sir John Marsham has treated the subject in a manner befitting a scholar intent on nothing but the discovery of truth.

MARSH'S APPARATUS. [Arsenic, Detection of.]

MARSHFIELD. [Gloucestershire.]

MARSTON, JOHN, a dramatist in the reigns of Elizabeth and James I., the particulars of whose life, and even the exact times of whose birth and death are, like those of many of his contemporary poets, very uncertain. Marston left several plays, of which the 'Malecontent,' printed in Dodsley's Collection, is the best; but, from the title-page of the first edition (1660), it appears to have been written by Webster, and only altered by Marston. He also joined with Jonson and Chapman in 'Eastward Hoe.' His miscellaneous poetical works were collected and published in 1764.

MARSUPIA'LIA, or MARSUPIA'TA (*Marsupium*, a purse or bag), an extensive group of Mammalia, differing essentially from all the others in their organization, and comprehending genera fed by every variety of nourishment. Their structure is, as a necessary consequence, modified accordingly; and we find among them an adaptation of the organs of progression, prehension, and digestion, to their several wants and habits, so that we may trace in them analogies to the carnivorous, insectivorous, herbivorous, and rodent forms of the other mammiferous quadrupeds.

Cuvier, who had the advantage of knowing the great quantity of species and variety of forms discovered in New Holland, arranged the copious materials which that extraordinary country afforded in addition to the few American forms, as the fourth order of his *Mammifères*, dividing the now numerous group into several subdivisions, and placing the order between his *Carnassiers* and his *Rodentia*.

Professor Owen and many zoologists consider that the mammalia are divided into two subclasses, viz. *Placentalia*, and *Implacentalia*. The Implacentalia are again divided into two orders or primary groups, *Marsupialia*, and *Monotremata*.

According to Professor Owen's arrangement five tribes come under the head of *Marsupialia*, namely, *Sarcophaga*, *Entomophaga*, *Carpophaga*, *Poephaga*, and *Rhizophaga*. These tribes are divided into several families, and these families into genera and subgenera. (See Prof. Owen in 'Proc. Zool. Soc.,' 1839.

The order *Monotremata* comprises two genera, namely, *Echidna* and *Ornithorhynchus*.

Mr. Waterhouse, in his 'Natural History of the Mammalia,' 1845, appears to consider the *Marsupiata* as an order comprising two sections, *Monotremata*, and the true *Marsupiata*.

The *Marsupiata* or *Marsupialia*, says Mr. Waterhouse, 'are implacental mammalia, whose young are brought forth prematurely, and received in most instances into a peculiar pouch situated on the lower part of the abdomen in the female; both sexes are furnished with two bones called marsupial bones, which are attached to the anterior margin of the pelvis. The brain is deficient of both corpus callosum and septum lucidum; the cerebrum is small in proportion to the animal, and contracted in front, and its surface is smooth, and presents but few convolutions; the cerebellum is entirely exposed, and has the vermiform process large in proportion to the lateral lobes; the olfactory lobes are large. Two venæ cavæ enter the heart.'

The quadrupeds which range themselves under the order Marsupialia are familiarly known as Opossums, Phalangers, Kangaroos, &c. 'At the present period the great metropolis of the order is Australia. Certain species of the group however are found in the Molucca Islands, and one genus (*Didelphys*), containing many species, is peculiar to the New World, and although chiefly confined to the tropical portions, is met with as far north as the United States (where however one species only, *D. Virginiana*, is found), and extends in the southern direction to Buenos Ayres, on the east side of the Andes, and Valparaiso on the west. The species found in the islands north of Australia (if we except New Guinea), all belong to one genus, *Phalangista*, which occurs likewise in Australia, but they agree amongst each other in having the fur short, dense, and crisp, and the

tail with the apical portion naked, and studded with fleshy warts — characters which, in the opinion of some naturalists, entitle them to the rank of a subgenus, to which the name *Cuscus* is applied. No Phalangers presenting these peculiarities have been found in Australia. In New Guinea the Marsupialia increase in numbers, since, notwithstanding its coast line is not yet completed on our charts, and the interior is almost unknown, seven species of marsupial animals have been discovered in that island, and these appertain to six distinct genera, one of which only, it must be observed, is peculiar to New Guinea (viz. *Dendrolagus*). Of the species five are peculiar; one is said to be identical with a species found in New South Wales.'—Waterhouse.

The Marsupialia are divided by Mr. Waterhouse into the following families :—

1. *Macropodidæ*. Locality, Australia and islands. Examples—The Great Kangaroo (*Ma-*

Great Kangaroo (*Macropus giganteus*).

cropus giganteus); the Tree Kangaroos of New Guinea (*Dendrolagus*); the Rat Kangaroos, or Potoroos of Australia and Van Diemen's Land. Examples—*Hypsiprymnus murinus*; *Macropus minor*, Shaw; Kangaroo Rat.

2. *Phascolomyidæ*. Locality, Australia, Van Diemen's Land, and some of the islands of Bass's Straits. Example—The Wombat (*Phascolomys Wombat*).

3. *Phalangistidæ*. Examples — The Koala (*Phascolarctos cinereus*). Locality, New South Wales. The Vulpine Phalanger (*Phalangista Vulpina*). Locality, Australia. The Spotted Phalanger (*Cuscus maculatus*). Locality, Amboyna, New Guinea, &c. The Flying-Squirrel (*Petaurus sciureus*). Locality, New South Wales.

4. *Peramelidæ*. Example—The Long-Nosed Perameles (*Perameles nasuta*). Locality, Norfolk Island and New South Wales.

5. *Dasyuridæ*. Examples — The Banded Myrmecobius (*Myrmecobius fasciatus*). Locality, Western Australia. The Pencilled Phascogale (*Phascogale penicillata*). Locality, Australia. The Spotted Dasyurus (*Dasyurus viverrinus*). Locality, Australia. The Ursine Dasyurus (*Dasyurus ursinus*). The Dog-headed Thylacinus (*Thylacinus cynocephalus*). Locality, Van Diemen's Land.

6. *Didelphydæ*. Examples—The Virginian Opossum (*Didelphys Virginiana*). Locality, the southern portion of North America. The Water-Opossum (*Cheironectes variegatus*). Locality, Guinea and Brazil.

Virginian Opossum (*Didelphys Virginiana*).

Those who are desirous of inquiring into the anatomy of the Marsupialia, may refer to Prof Owen, in 'Zool. Proceedings,' 1838, 1843; 'Phil Transactions,' 1834; and 'Marsupiata,' in the 'Nat. Hist. of Mammalia,' by Mr. Waterhouse.

At a former period, the marsupial animals were much more widely diffused than at present, as is proved by the discovery of their fossil remains which occur not only in Australia and South America, but also in Europe.

'In the caverns which occur in the calcareous rocks in the interior highlands of Brazil, the bones of small opossums are very numerous, but these are for the most part very nearly allied to if not identical with species still living in Brazil. In Europe the most authentic remains of marsupial animals are those found in the gypsum quarries of Montmartre. The greater portion of a skeleton in which the marsupial bones remain in their natural position with regard to the pelvis in which the lower jaw presents the angular portion curved inwards, and in which the molar teeth correspond precisely with those of *Didelphys*, leaves no doubt as to the existence of marsupial animals in Europe in the Eocene geological period. Besides this opossum-like animal, a lower jaw found in the same quarries has been referred to the marsupial group; it forms the genus *Pterodon* of De Blainville. In formations considerably lower in the series than the Eocene in the Stonesfield oolite, have been found several rami of lower jaws of small insectivorous mammalia, some of which in their general form, and in the dentition which they present, approximate very closely to the insectivorous marsupialia. These however cannot be arranged in any known recent group of *Marsupialia:* they form the genera *Thylacotherium*, or *Phascolotherium*, Professor Owen. To the latter genus belongs the *Didelphys Bucklandi* of Mr. Broderip, founde

upon a very perfect ramus of the lower jaw, presented by that gentleman to the British Museum.

'The marsupial remains found in Australia are chiefly from the caverns of Wellington Valley, New South Wales. A considerable collection of these remains was found by Major (now Sir T. L.) Mitchell, and are described, in that gentleman's work, by Prof. Owen, 'Three Expeditions into the interior of Eastern Australia,' &c., by Major T. L. Mitchell, Surveyor-general. It appears from the remains of these and other fossil remains from Australia, that they are referable for the most part to genera still presenting living species in the same country; there are some however which exhibit some very remarkable modifications of the marsupial structure, and form the types of new genera.'—Waterhouse.

Dr. Buckland observes, that 'the discovery of the *Marsupialia*, both in the secondary and tertiary formations, shows that this order, so far from being of more recent introduction than other orders of Mammalia, is in reality the first and most ancient condition under which animals of this class appeared upon our planet;—that, as far as we know, it was their only form during the secondary period;—that it was co-existent with many other orders in the early parts of the tertiary period; and that its geographical distribution in the present creation is limited to North and South America, and to New Holland, with the adjacent islands.'—Bridgewater Treatise.

MARTEL. [Lot.]

MARTEL, CHARLES. [Charles Martel.]

MARTELLO TOWER, a circular building of masonry, generally two stories high. The lower story is divided into chambers for the reception of stores, and the upper serves as a casemate for troops. The roofs are vaulted, and that of the upper story is shell-proof. On the terreplein of the roof are placed pieces of artillery, which rest on platforms of timber traversing on pivots, so that the guns are capable of being fired in any direction. The whole work is generally surrounded by a ditch and glacis.

MARTEN. [Weasels.]

MARTIAL LAW is a series of regulations made to preserve order and discipline in the army, and enforced by the prompt decisions of courts-martial: this is generally however called military law. During the existence of a rebellion, when, in consequence of the ordinary processes of law becoming ineffectual for the security of life and property in any province or state, the legislature has appointed that a military force shall be employed to suppress the disorders and secure the offenders; and when the trial of the latter takes place according to the practice of military courts, that province or state is said to be subject to martial law.

On the occurrence of such an event in any part of the British dominions, the two houses of parliament, jointly with the crown, determine that a temporary suspension of the Habeas Corpus Act shall take place. This measure is adopted only in cases of great emergency; and the necessity of it and the time of its duration are always stated in the provisions of the act. The act by which martial law was declared in Ireland during the Rebellion in 1798 may be seen in Tytler's 'Essay on Military Law,' Appendix, No. 6.

In merely local tumults the military commander is called upon to act with his troops only when the civil authorities have failed in preserving peace; and the responsibility of employing soldiers on such occasions falls entirely upon the magistrate.

The constitution of this country permits a military law for the government of the army, even in times of internal tranquillity, to co-exist with the general law of the land. But the former applies to military persons only. Among these its jurisdiction comprehends all matters relating to the discipline of the army, to the cognizance of which the civil courts are not competent—as disobedience of orders, cowardice, &c.; and extends to such crimes as desertion, mutiny, and holding correspondence with the enemy.

MARTIA'LIS, MARCUS VALE'RIUS, was a native of Bílbilis, in Spain, where he was born, about 40 A.D. He came to Rome at an early age, and passed about thirty-five years of his life in that city. He left Rome probably about the commencement of Trajan's reign, and retired to his native town. Domitian gave him the 'jus trium liberorum,' and conferred on him the dignity of tribune ('Epig.' ii. 91; iii. 95), for which and other favours the grateful poet made a most abundant return of flattery. Martial was acquainted with most of his literary contemporaries, Juvenal, Quintilian, Pliny the Younger, and others, as appears from his own writings (ii. 90; xii. 18, &c.)

There are extant of Martial fourteen books, entitled 'Epigrammata,' of which the thirteenth also bears the particular name of Xénia, and the fourteenth that of Apophoréta. A book called 'Spectaculorum Liber,' which is prefixed to the 'Epigrams,' contains a number of small poems on the shows of Titus and Domitian. The whole collection contains above 1500 epigrams.

Many of the epigrams of Martial belong to that class of compositions which are now called epigrams, and may be considered as the prototype of that species of composition: they are short pieces, varying in length from two lines to four, six, or more, the point of which is generally contained in the last line. Like modern compositions of this kind, the thought is often forced and laboured, and the meaning sometimes obscure. Other of his compositions belong to that class more properly called epigrams [Epigram], according to the original signification of the word, and are often characterised by great felicity of expression: they are on a great variety of subjects, and contain much matter that requires comment. There is perhaps no Roman writer extant whose works, if well studied, would be so useful as Martial in illustrating the period in which he lived.

The editions and translations of Martial are very numerous. The latest is by Schneidewin, 2 vols. 8vo. There are several English translations, the latest of which, so far as we know, is that by James Elphinstone, London, 1782.

MARTIGUES. [Bouches-du-Rhône.]

MARTIN, SAINT. [Antilles.]

MARTIN I. II. III. IV. V. [Pope.]

MARTIN, the name for some of the Swallow tribe, as the *House Martin* (*Hirundo urbica*, Linn.), the *Bank* or *Sand Martin* (*Hirundo riparia*), and the *Black Martin*, or *Swift*. [Swallows.]

MARTIN-DE-LA-RE'. [Charente Infe'rieure.]

MARTI'NI, GIAMBATTISTA, was born at Bologna in 1706, and died in 1784. He became maestro di capello in 1723 in the Franciscan convent, to which order he belonged. His sixty Canons in the unison, for two, three, and four voices are still known and admired; but his chief reputation rests on his 'Essay on Counterpoint,' published in two folio volumes at Bologna, in 1774, and on his 'History of Music,' in three volumes 4to., the last of which appeared in 1781.

MARTINIQUE, or MARTINICO, one of the largest of the Caribbee Islands, is 10 leagues south-south-east of Dominica. The greatest length is 50 miles from north-west to south-east, and the mean breadth is about 16 miles; in form it is very irregular, and its surface is very uneven, being generally occupied by conical-shaped hills, of which one, Mont Pelée, is an exhausted volcano. The island contains a great number of streams, and the coast, being indented by numerous bays and inlets, affords many good harbours. There are two principal towns, Saint Pierre and Port Royal, both on the west side of the island. *Port Royal*, the residence of the governor, stands on the north side of a deep and well sheltered bay, protected by a fort which covers the whole surface of a peninsula, and commands the town and harbour. *Saint Pierre* is an open roadstead, affording very indifferent shelter to shipping, but it is the principal place of trade in the island, and it is said to be the handsomest town in the West Indies.

The population of the island in 1841 was 121,145, of whom 75,525 were slaves.

The staple production of the island is sugar, to which is added small quantities of coffee, cotton, cocoa, and cloves.

Martinique was first settled by a party of about 100 men, headed by a French planter, M. Desnambre, from St. Christopher, in 1635. It was taken in 1762 by the English, but was restored at the peace in the following year. In 1794 it was again taken by the English, and again restored to France at the peace of Amiens. It was once more captured by the English in 1810, and finally restored by the treaty of Paris in 1814, since which time it has remained under the dominion of France. At the beginning of 1839 it suffered greatly from an earthquake.

MARTINO. [Memmi di Martino.]

MARTOS, IVAN PETROVITCH, director of the Academy of Fine Arts, St. Petersburg, was the most eminent sculptor Russia has yet produced. The number of his works is very considerable, and among the more important are the following public monuments:—The bronze colossal group of the patriots Minin and Pozharsky, at Moscow; the monument to the Emperor Alexander, at Taganrog; the statue of the Duke of Richelieu, at Odessa; Potemkin's monument, at Cherson; and that erected in honour of Lomonosov, at Arkhangel. Martos died April 17, 1835.

MARTYN, HENRY, known as *The Missionary*, was born at Truro, 1781. He went to Cambridge in 1757, and became senior wrangler in 1801, and a fellow of St. John's in 1802. His intimacy with the Rev. Charles Simeon led to his adoption of ardent religious principles, and ultimately to his devoting himself to the duties of a missionary in 1805. In this capacity he traversed large tracts of India and Persia, and finally died at Tokat, in Asia Minor, in 1812.

MARTYR, JUSTIN. [Justin Martyr.]

MARTYRS, MARTYROLOGY, from the Greek *Martur*, a witness.

By the term *martyr* we now generally understand a person who suffers death rather than renounce his religious opinions; and those who have made a profession of their faith and thereby endured sufferings short of death are called *confessors*. The annals of the early Christian church contain the histories of many martyrs, whose astonishing fortitude under the most cruel tortures was doubtless one great cause of the rapid diffusion of Christianity. We learn from the writings of Cyprian, Bishop of Carthage (A.D. 248), that the sufferings of martyrdom were held to purge away the stain of sin, so that the martyr was admitted at once into paradise without needing the fires of purgatory. Martyrs were thought to expiate by their blood not only their own sins, but those of other men, and even of the church; and the fiery baptism of martyrdom was accounted of equal efficacy with the sacraments of Christ. The earliest account of a Christian martyrdom is that of Stephen in the Acts (vii.). It is very difficult to ascertain the number of martyrs who suffered in the early persecutions.

That department of ecclesiastical history which relates to the acts and deaths of martyrs is termed *Martyrology;* and a work embracing one or more such narratives is called *a Martyrology*.

MARVEJOLS. [Loze`re.]

MARVELL, ANDREW, was born Nov. 15, 1620, at Kingston-upon-Hull. At the age of fifteen he was sent to Trinity College, Cambridge.

Marvell was twice elected member for Hull in 1660. He distinguished himself by his steady opposition to the court party, who attempted in vain by bribes and patronage to induce him to swerve from his course.

He seems to have been on the continent during the latter end of 1661, and about three months after his return he again left England as secretary to Lord Carlisle, who was appointed ambassador extraordinary to Russia, Sweden, and Denmark. Marvell was absent on this embassy nearly two years. He died Aug. 16, 1678, aged 58 years. Marvell's prose publications, though containing much wit and caustic satire, were mostly of temporary interest. His verse did not possess sufficient vitality to secure its continued existence.

MARWAR. [Rajpootana.]

MARY I., Queen of England, was the daughter of Henry VIII., by Catherine of Aragon, and

was born at Greenwich, on the 18th or 19th of February, 1516. She was brought up from her infancy in a strong attachment to the ancient religion, but was induced, from motives of self interest, to comply with the reforms of her father. Her adherence to the Roman faith finally induced Edward to attempt to exclude her from the succession. [GREY, LADY JANE.]

Mary was scarcely seated on the throne when she proceeded to re-establish the ancient religion. The indications given by the court of a determination to be completely reconciled with Rome were followed by an insurrection headed by Sir Thomas Wyatt, January, 1554, which was in a few days effectually put down. Its suppression was followed by the executions of Lady Jane Grey, her husband, and father, and finally of Wyatt himself.

On July 25, Mary was married to the prince of Spain, afterwards Philip II.; and the reunion with Rome was completed by a parliament which assembled in the beginning of November, and which passed acts re-establishing the whole national system of religious policy as it had existed previous to the first innovations made by Henry VIII. The remainder of the history of the reign of Mary is occupied chiefly with the sanguinary persecutions of the adherents to the reformed doctrines. On the most moderate calculation, and making every reasonable allowance, it will be found 'that in the space of four years almost two hundred persons perished in the flames for religious opinion.' The principal political result of the Spanish alliance was the loss of the town of Calais, the last of the English possessions in France. Mary died, Nov. 17, 1558. She left no issue, and was succeeded by her half-sister Elizabeth. [ELIZABETH.]

MARY STUART, Queen of Scotland, was born Dec. 7, 1542. She was the third and only surviving child of James V. of Scotland, by Mary of Lorraine, daughter of the duke of Guise. At the time of her birth her father lay sick in the palace of Falkland; and a few days afterwards he expired. The ambitious Beatoun, archbishop of St. Andrews, produced a testament which he pretended was that of the late king, and immediately assumed the office and title of regent. The instrument was discovered to be a fraud; but Beatoun did not lose his influence, and on September 9, 1543, Mary was crowned by the archbishop, who was appointed lord high chancellor of the kingdom. He had even the address to win over the regent Arran to his views, both political and religious; and thus the French or Roman Catholic party obtained the ascendancy, in furtherance of the objects of which Mary was married to Francis, the Dauphin of France, April 24, 1558, and her early years were passed amidst the gaieties of the French court. On the death of Queen Mary of England, claims were put forth on behalf of the Queen of Scots through her grandmother, who was eldest daughter of King Henry VII.; and notwithstanding Elizabeth had ascended the throne, those claims were urged with great pertinacity by the princes of Lorraine, her uncles.

Henri II. died in July, 1559, and in September of the same year Francis was solemnly crowned at Reims. Mary was now at the height of her splendour; it was doomed however to be of short continuance. In June, 1560, her mother died; and in December of the same year, her husband. Mary then returned to Scotland, and landed at Leith, Aug. 19, 1561, after an absence of nearly 13 years. During that time Presbyterianism had gained the ascendant in Scotland, and Mary's adherence to the old faith would have put an end to her popularity, but for her amiability and affable manners. On the 29th of July, 1565, she was married to her cousin Henry Stuart, Lord Darnley, the youthful heir of the house of Lennox. This marriage was not a popular one in several quarters, and though it gave no general dissatisfaction, there existed no real sympathy between the queen and her people. Her patronage, of favourites was generally condemned. Of these the principal were Chatelard the French poet, and the Italian musician, Rizzio. Of these, the former was executed, and the latter murdered by some of the Reformers, by direction, it is supposed, of Darnley. Darnley died not long afterwards under suspicious circumstances. After a short stay in Glasgow, he had returned to Edinburgh with the Queen, when Darnley was lodged, not in the palace of Holyrood, as heretofore, but in the house of the Kirk of Field, a mansion standing by itself in an open and solitary part of the town. Ten days after, the house was blown up by gunpowder, and Darnley and his servants buried in the ruins. Whether Mary knew of the intended murder is not certain. The author of the horrid deed was the Earl of Bothwell, who was brought before the privy-council for the crime; but in consequence of the shortness of the notice, Lennox, his accuser, did not appear, and without a single witness being examined, he was acquitted. Three months after, having in the interval met the queen, and carried her off a prisoner to his castle of Dunbar, and obtained a divorce against his wife, on the ground of consanguinity, he was married to Mary, who had previously created him Duke of Orkney.

Public indignation could no longer be restrained. The nobles rose against Bothwell and Mary, who fled before an armed and indignant people from fortress to fortress. At length, after they had collected some followers, a pitched battle near Carbery Hill was about to ensue, when Mary abandoned Bothwell, and threw herself on the mercy of her subjects. They conducted her first to Edinburgh, and thence to the castle of Lochleven, where it was determined she should at once abdicate in favour of the prince her son, James. Instruments of abdication to that effect were accordingly prepared, and she was at last constrained to affix her signature to them; upon which the prince was crowned at Stirling, July 29, 1567, when little more than a year old. Mary continued a prisoner at Lochleven; but in a few months effected her escape, and collected a considerable army. The battle of Langside ensued, where she was completely routed; upon which she fled into England, hoping to secure the favour

of Elizabeth. In this however she was mistaken. Elizabeth detained her a captive till the end of the year 1586,—a period of about nineteen years,—when she was accused and declared guilty of being accessory to Babington's conspiracy against the Queen of England, and beheaded at Fotheringay Castle, Feb. 8, 1587.

MARY, Wife of William III. [WILLIAM III.]

MARY, SAINT. [AZORES.]

MARY, DUCHESS OF WÜRTEMBERG, or the Princess Marie d'Orleans, was born in April, 1813, during the exile of her father Louis-Philippe, then Duke of Orleans, and residing at Palermo with his wife Amelia. She was married to the Duke of Würtemberg in 1837, and she died at Pisa, in January, 1839, in consequence of injuries suffered from the conflagration of her palace at Stuttgart.

From her childhood she evinced a great love for art, and her father procured for her some excellent instructors. Some of her works in sculpture have already acquired her a European reputation; among these her marble statue of Joan of Arc is the most popular. She executed also an equestrian statue of Joan of Arc, and a small model of the Death of Chevalier Bayard.

MARYBOROUGH. [QUEEN'S COUNTY.]

MARYLAND, one of the United States of North America, lies between 38° 3′ and 39° 44′ N. lat., and 75° 10′ and 79° 20′ W. long. It is divided into two portions by Chesapeake Bay and the Susquehanna. That portion which is east of the bay is bounded S. by Virginia and E. by the Atlantic Ocean and Delaware. Pennsylvania forms the whole northern boundary of this state, and Virginia and the Potomac form the boundary of the rest of the state. The area is 13,959 square miles. The population in 1840 was 469,232, of whom 89,495 were slaves.

Surface and Soil.—The country east of Chesapeake Bay has a level surface as far north as Chester Bay, where it begins to be undulating, and towards the boundary of Pennsylvania isolated hills make their appearance. The soil is generally thin and sandy, but tolerably well cultivated. Along the shores both of the Atlantic and Chesapeake Bay marshy tracts of some extent occur. The largest is the Cypress Swamp. [DELAWARE.] Along the eastern side of Chesapeake Bay several indentations occur, forming harbours for vessels of moderate size. There are also several islands belonging to Maryland in Chesapeake Bay, of which the largest is Kent Island.

The country on the opposite shore of Chesapeake Bay is of the same description, but rather less fertile. North of the river Patapsco the country along the Chesapeake Bay is undulating, and possessed of a greater degree of fertility. About twenty miles from the shore the country rises into hills, which extend westward to the foot of the Blue Ridge, a part of the Appalachian range, a distance of about forty miles. The country west of 77° 30′ W. long. is mountainous, being traversed by six or seven of the ranges which compose the Appalachian system. The ranges are rather narrow, but they rise to an elevation of from 2000 to 2500 feet.

Rivers.—The Potomac rises within the Appalachian Mountains, with two branches: the northern branch rises in 39° 12′ N. lat., on the eastern declivity of the Backbone Range. Twenty miles below Cumberland it is joined by the southern branch, which rises in the centre of Virginia, about 38° 25′ N. lat. After this junction the Potomac flows S.E. and S. till it falls by a wide æstuary into Chesapeake Bay. The Potomac is navigable to the city of Washington, and is 7½ miles wide at the mouth, and one mile at Alexandria, to which place it is navigable for vessels of the largest class. [ALEXANDRIA.] The Patuxent is 110 miles long, and is navigable for 50 miles by vessels of 250 tons burthen. The Patapsco is a small river navigable to Baltimore. The Susquehanna traverses the northern part of Maryland for fifteen miles, before it falls into Chesapeake Bay.

Climate and Productions.—The climate is rather mild in the level part of the country, but the winter is sometimes severe enough to block up the harbour of Baltimore with ice for some weeks. Rain is rather abundant; drought is rare.

Wheat, Indian corn, and tobacco are chiefly cultivated; and rye, oats, and barley less extensively. The common fruits of England, as apples, pears, plums, and peaches, succeed in most places. Hemp and flax are raised to a considerable extent in the upper valleys. The whole country was originally covered with a dense forest, of which a considerable part still remains. Along the coasts of the Atlantic and the adjacent swamps a wild vine grows, the grapes of which yield a pleasant wine.

In the forests on the mountains, wolves, bears, and deer are still found.

The principal minerals are coal and limestone. Coal does not occur to the eastward of Cumberland, but west of that town it is abundant. Iron-ore is met with in several places.

Railways and Canals.—The Chesapeake and Ohio Canal is now in progress, and intended to extend to Pittsburg, 341 miles. It is now completed from Georgetown in Columbia to Cumberland, 185 miles. The Baltimore and Ohio Railroad, intended to extend to Wheeling, 360 miles, has already been completed from Baltimore to Cumberland, and probably farther. There are several other smaller railroads.

Manufactures and Commerce.—The State contains about 30 woollen and 20 cotton manufactories, and there are various other articles manufactured, especially iron, ropes, leather, and spirits. Ship-building is carried on at Annapolis and Baltimore. An extensive commerce is carried on with the other States, the West Indies, and Europe, chiefly from Baltimore.

Political Division and Towns.—Maryland is divided into 20 counties. The following are the principal towns, with the population of each in 1840:—*Annapolis* is the capital of the State [ANNAPOLIS.] *Baltimore* is one of the most important commercial cities in the United States [BALTIMORE.] *Cumberland*, situated on the north bank of the Potomac, at the mouth of Will's Creek, 134 miles W. from Washington, and 166

miles W.N.W. from Annapolis, contains a court-house, a gaol, a market-house, and 5 churches. It is the centre of an extensive trade in iron and coal. *Frederick*, a city 75 miles W.N.W. from Annapolis, is well-built, with wide and regular streets, and contains a court-house, gaol, county-offices, and 12 churches. Population, 5182. *Hagerstown*, 26 miles N.W. from Frederick, is regularly laid out, and contains a handsome court-house, a town-hall, masonic hall, and 9 churches. Population 3750.

History and Constitution.—Maryland was first settled as a place of refuge for the persecuted Roman Catholics of England by Lord Baltimore [BALTIMORE, LORD] in 1634, and the country received the name of Maryland from Henrietta Maria, the wife of Charles I. In 1699 the seat of government was fixed at Annapolis, where it has ever since remained. The constitution of the state was adopted in 1776, and has since been often amended. The legislative body consists of 21 senators, who are elected for 6 years, and 82 representatives, who are elected for 2 years. The governor is elected for 3 years. Maryland sends 2 senators and 6 representatives to Congress. There are some German settlers in the west part of the State.

MARYGOLD. [CALENDULA.]

MARYPORT. [CUMBERLAND.]

MAS-D'-AZIL. [ARIE'GE.]

MASA'CCIO, called *Maso da San Giovanni*, was born at San Giovanni in Val d'Arno, in the year 1401, and died in 1443. He was a disciple of Masolino da Panicali, to whom he proved as much superior as his master was to all his contemporaries. His most perfect works are the frescoes of S. Pietro del Carmine at Florence.

MASANIELLO. [ANIELLO.]

MASCAGNI, PAUL, was born in 1752. He studied medicine in the university of Siena, and in 1774 succeeded his master, Tabarani, in the professorship of anatomy in that institution. He is chiefly celebrated for his admirable work on the absorbent system, 'Vasorum Lymphaticorum, Corporis Humani Historia et Ichnographia,' Siena, 1787; and the beauty of his anatomical preparations, of which the greater part are preserved in the Anatomical Museum of Florence. In 1800 he left the university of Siena for that of Pisa, and the year after went to that of Florence. He died in 1815.

MASCARENHAS. [BOURBON, ISLE OF.]

MASCLEF, FRANCIS, was born at Amiens in the year 1662. He very early devoted himself to the study of Oriental languages, in which he attained an extraordinary degree of proficiency. Having been brought up to the church, he became a canon, and was for a time head of the theological seminary of Amiens; but his opinions on the Jansenist controversy not being in accordance with those of the bishop, he was compelled to retire from public life about 1706. From this time he devoted himself to study with such close application as to bring on a disease, of which he died Nov. 24, 1728, at the age of 66.

Masclef's chief work is the 'Grammatica Hebraica, à Punctis aliisque Inventis Massorethicis libera,' in which he embodied an elaborate argument against the use of the vowel points.

MASE'RES, FRANCIS, was born in London, December 15, 1731. His father was a physician, descended of a family which was driven out of France by the revocation of the Edict of Nantes. He was educated at Clare Hall, Cambridge, and took the degree of B.A. in 1752, obtaining the highest place, both in classics and mathematics. He then (having first obtained a fellowship in his college) removed to the Temple, was in due time called to the bar, and went the Western circuit for some years with little success. He was then appointed (the date is not mentioned) attorney-general for Canada, in which province he remained till 1773, distinguished by his loyalty during the American contest, and his zeal for the interests of the province. On his return in 1773 he was appointed cursitor baron of the Exchequer, which office he held till his death. He was also at different times deputy recorder of London and senior judge of the sheriff's court. He died May 19, 1824, at Reigate, in the 93rd year of his age.

Baron Masères (as he was commonly called) has left behind him a celebrity arising partly from his own writings and partly from the munificence with which he devoted a part of his income to reprinting such works as he thought useful, either in illustration of mathematical history, or of that of his own country.

Of the reprints which Baron Masères made at his own expense, the most important is the 'Scriptores Logarithmici,' a collection, in six volumes quarto, published in various years from 1791 to 1807, of writings on the subject of logarithms. Here we find the works of Kepler, Napier, Snell, &c., interspersed with original tracts on kindred subjects. The republication of these old writings has put them in the way of many students to whom they would otherwise have been inaccessible, and has thus tended to promote historical knowledge and to excite inquiry. The 'Scriptores Optici,' 1823, a reprint of the optical writings of James Gregory, Descartes, Schooten, Huyghens, Halley, and Barrow, has a merit of the same kind.

MASHAM, ABIGAIL, was the daughter of Francis Hill, a merchant of London, who married the sister of Mr. Jennings, the father of the Duchess of Marlborough. Her relative, then Lady Churchill, procured her the place of waiting-maid to the Princess Anne. She retained her situation after the princess ascended the throne, and acquired great influence over her. Miss Hill married Mr. Masham (son of Sir Francis Masham, of Otes in Essex) in 1707. Harley, afterwards earl of Oxford, connected himself with the new favourite; a change of ministry took place, and in 1711 Mr. Masham was raised to the peerage. He and his wife appear to have been engaged in the intrigues of the tories in favour of the exiled House of Stuart. Lady Masham lived a long time after the death of the queen, and died at an advanced age, December 6, 1734.

MASHING. [DISTILLATION.]

MASKELYNE, NEVIL, was born in London,

October 6, 1732. was educated at Westminster, and afterwards at Catherine Hall and Trinity College, Cambridge, in which university he took the degree of B.A., with distinction, in 1754. In 1755 he took orders, but he had previously been led to turn his attention to astronomy by the solar eclipse of 1748, and by becoming acquainted with Bradley, whom he assisted in the formation of his tables of refraction. In 1761 he went to St. Helena, to observe the transit of Venus, and to detect, if possible, the parallax of the fixed stars. In this voyage, and in one undertaken to Barbadoes, in 1764, to try the merits of Harrison's new chronometers, he acquired that knowledge of the wants of nautical astronomy which afterwards led to the formation of the Nautical Almanac. In 1765 he was appointed to succeed Mr. Bliss as astronomer royal, and from this time, with the exception of his voyage to Scotland in 1772, to determine the mean density of the earth by observing the effect of the mountain Schehallien upon the plumb-line, his life was one unvaried application to the practical improvement of astronomical observation. He died Feb. 9, 1811.

Delambre dates the commencement of modern astronomical observation, in its most perfect form, from Maskelyne, who was the first who gave what is now called a standard catalogue (A.D. 1790) of stars; that is, a number of stars observed with such frequency and accuracy, that their places serve as standard points of the heavens.

MASON, WILLIAM, born in 1725, was the son of a clergyman at Hull. He took his B.A. degree at Cambridge in 1745, after which he removed from St. John's College to Pembroke, of which college he was elected fellow in 1747. Having taken orders, he was presented to the rectory of Aston in Yorkshire, and became chaplain to the king. He died in 1797, aged 72, having been for years precentor and canon-residentiary of York.

Mason's Poems are now little read. Two tragedies, 'Elfrida,' and 'Caractacus,' a descriptive poem called 'The English Garden,' and some odes, are his principal productions; but he is now perhaps best remembered as Gray's biographer and friend.

MASONRY (from the French *maison* and *maçon*) signifies both the operation of constructing with stone and the parts of a building consisting of such material. It is a most important branch of architectural practice. Owing to its expense, masonry is comparatively rarely employed in this country, except for public buildings or others of the highest class, the mason's work being in other cases restricted to such parts as steps to doors, string-courses, facias, and plain cornices externally, and to pavements and stairs in the interior.

The different kinds of stone used in masonry are noticed in the article STONE FOR BUILDING.

Walls which are not of solid masonry throughout, but built either of brick or inferior stone and rubble, with only an external facing of squared stone laid in courses, are termed *ashler*, or *ashlering*.

MASONS, FREE. All that is known with certainty with respect to the origin of the Free-Masons is, that there were fraternities or guilds so called, established during the middle ages in the various countries of Europe. By means of these associations the inventions and improvements made in architecture were communicated from one country to another, a circumstance which at once accounts for the sudden spread of Pointed or Gothic architecture throughout the whole of the west of Europe, and at the same time renders it so exceedingly difficult to determine at all satisfactorily where that style actually originated, or what nation contributed most towards its advancement. Owing also to the jealousy with which the Free-Masons kept their knowledge to themselves, it is not at all surprising that the history of the art during the middle ages should be involved in so much obscurity that it can now be traced only by its monuments, all documents relative to the study of it having been concealed as much as possible, even when something of the kind must have been in existence.

In this country an act was passed against Free-Masonry in the third year of Henry VI., at the instigation of the bishop of Winchester. It was however never enforced, and Henry himself afterwards countenanced the brethren by his presence at lodges of Free-Masons. It was also patronised by James I. of Scotland: but as it was no longer indispensable to the church, which had previously encouraged and protected it, Free-Masonry gradually declined; and though it revived again in this country about the time of the civil war, it was merely in semblance, being altogether different in object and character from what it had been, having become merely speculative or modern Free-Masonry, an institution in nowise connected with architectural practice. From this country it was first introduced into France about the year 1725; into Spain in 1728; and into Italy in 1733, when the first masonic lodge was established at Florence. It was afterwards however the object of persecution not only in France and Italy, but also in Holland and Germany. Lodges of Free-Masons are now more or less numerous in all parts of the civilized world. These societies are understood to be for charitable as well as for social and convivial purposes.

MASOVIA. [POLAND.]

MASQUE. [ENGLISH DRAMA.]

MASQUERADE, an amusement introduced into England in the 16th century from Italy. It is distinguished from the masque by the general mingling of the company in dance and conversation, in place of the execution of a particular dance or preconcerted action by certain individuals. Granacci, who died in 1653, is said to have been the inventor of masquerades.

MASS. By the mass of a body is meant the quantity of matter which it contains, upon the supposition that differences of weight are always the consequence of different quantities of matter. This involves an hypothesis: for instance, if gold be, bulk for bulk, nineteen times as heavy as water, it is presumed that a given bulk of gold contains nineteen times as much matter as the same bulk of water.

MASS (*Missa*, in Latin) is a church service which forms an essential part of the ritual of both the Roman Catholic and Greek or Eastern churches, and in which the consecration of the sacramental bread and wine takes place. It is performed entirely by the officiating priest standing before the altar, and attended by a clerk who says the responses. The prayers of the mass are all in Latin in the Roman Catholic church, in ancient Greek in the Eastern church, and in Syriac among the Maronites and Jacobites, but never in the vulgar or vernacular tongue of the country.

On great festivals and other solemn occasions the mass is performed by a priest or prelate, attended by a deacon and subdeacon, who says the responses and chants the epistle and gospel of the day. On those occasions the mass is sung, or at least parts of it, by a choir, accompanied by the organ and other musical instruments. This is called 'high mass,' and is a long and pompous service.

The 'Missale' is the name of the book which contains the ritual of the mass, and which the priest holds open before him on the altar. Some of the Old Missals, whether MSS. or printed, are beautifully ornamented with paintings, and are valued as bibliographic curiosities.

The Protestant and reformed churches have no mass, as they do not believe in the doctrine of transubstantiation, with which the service of the mass is essentially connected; but several of the detached 'Oremus,' or prayers of that service, which are very fine, have been retained in the liturgy of the Church of England, translated into the vulgar tongue.

MASSA, Duchy of. [CARRARA AND MASSA.]

MASSACHUSETTS, one of the United States of North America, lies between 41° 23′ and 43° 52′ N. lat., and 69° 50′ and 73° 10′ W. long.; but the two islands of Martha's Vineyard and Nantucket, which belong to it, extend as far south as 41° 12′. The Atlantic Ocean washes its eastern and southern shores. On the S. it is bounded by Rhode Island and Connecticut, W. by New York, and N. by Vermont and New Hampshire. Its greatest length is about 190 miles, and its greatest breadth 90 miles. The area is 7500 square miles. The population in 1840 was 737,699, of whom none were slaves.

Shores and Islands.—Narraganset Bay, which lies chiefly within the state of Rhode Island, enters by its most north-eastern inlet into Massachusetts, where it receives the Taunton river. Farther east is Buzzard's Bay, a deep indentation stretching in a north-eastern direction 30 miles into the mainland. The innermost corner is divided from Cape Cod Bay by an isthmus five miles in width. Buzzard's Bay is generally shallow, but vessels of considerable draught may ascend to New Bedford, 16 or 17 miles. On the east of Buzzard's Bay begins Barnstable Peninsula, which first stretches from the mainland E. by N. 35 miles, varying in width from 3 to 20 miles: it then changes to N. and N.W. about 30 miles, with a mean width of 2½ miles, and terminates at Cape Cod. Barnstable Peninsula incloses the southern portion of a large bay, which is sometimes called Massachusetts Bay, though that name is generally limited to the northern portion of it in front of Boston, and the southern, which is inclosed by the peninsula, is called Cape Cod and Barnstable Bay. This large bay extends northwards to Cape Anne in the form of a parallelogram, 55 miles long from S.S.E. to N.N.W., and 25 miles in width. North of Cape Anne the shores are somewhat high and rocky. South of Barnstable Peninsula are the islands of Nantucket and Martha's Vineyard. Nantucket is about 15 miles in length and 4 in breadth, rises to a very moderate height, and is level. Its sandy soil is almost entirely sterile, and the inhabitants live by fishing. Martha's Vineyard is about 16 miles in length and 8 in its greatest breadth; the surface is level and the soil sandy, but productive in some places. Some smaller islands, named Elizabeth Islands, lie near it. The wide bay which is inclosed by these islands on the S., and by Barnstable on the N., is called Nantucket Bay.

Surface and Soil.—The surface of the Barnstable Peninsula is level, or rather consists of two inclined planes, which attain an elevation of about 80 feet where they meet. The soil of this tract is sandy and light, but is cultivated with great industry. The country along the western side of Buzzard's Bay and the shores of Massachusetts Bay is similar in soil. But this flat country rises rapidly inland, and at the back of this level tract is a hilly region, which in the north-eastern districts extends nearly to the shores of the sea, and westward to the valley of the river Connecticut. Some of the hills rise to a considerable elevation, the highest, Mount Wachuset, attaining nearly 4000 feet. The most western district of the state is traversed from N. to S. by two continuous mountain ridges, of which the more elevated parts are from 3000 to 4000 feet high. The valleys of this district have a very fertile soil.

Rivers.—The western and mountainous region is traversed by the Housatonic, which flows S. nearly 50 miles, when it enters Connecticut; it is a very rapid river and not navigable in Massachusetts. The Connecticut enters Massachusetts from New Hampshire. [CONNECTICUT.] No considerable river falls into Massachusetts Bay. Charles River, which falls into Boston harbour, has a course of about 30 miles, and is navigable for about eight miles for large boats, the tide flowing up to Dedham. The Merrimac rises in New Hampshire on the western declivities of the White Mountains, north of 44° N. lat., and runs S. and S.S.E. till it is met by the Nashua river, when it curves E. and N.E., and falls into the Atlantic after a course of more than 150 miles. The tide ascends to Haverhill, 15 miles from its mouth, but above it the course of the river is obstructed by several falls and rapids, all of which are now avoided by canals, and an uninterrupted navigation has thus been effected as far up the river as Concord in New Hampshire. The importance of this river for internal navigation has been much increased by the Middlesex Canal.

Climate and Productions.—The climate of Massachusetts is much colder in winter, and warmer in summer, than the southern districts of

Great Britain, though the difference of latitude amounts but to about nine degrees. The mean temperature is 48°, or about two degrees less than that of London. The winter commences about the middle of December and terminates about the middle of March.

As Massachusetts was early settled, a greater portion of its surface is cultivated than in most of the other states, and agriculture has been more improved. The principal agricultural productions are—Indian corn, rye, oats, potatoes, hemp, flax, peas, hops, beans, and pumpkins, which last are used as food for swine and cattle. Wheat, buckwheat, and barley are raised only in smaller quantities. Forests still cover a considerable portion of the surface. All the fruit-trees of England are cultivated. Wolves are still found in the hilly region. The fishery of cod in Massachusetts Bay and on the banks near Nantucket is important, and also that of mackerel.

Iron occurs in several places, but is not much worked. Limestone abounds in the western parts of the state, where some good marble also occurs.

Canals and Railroads.—The Middlesex Canal begins at Charlestown, opposite Boston, and terminates on the Merrimac 2 miles above Lowell. The length is 27 miles. The Blackstone Canal extends from Worcester to Providence in Rhode Island, 45 miles. The Hampshire and Hampden Canal branches off from the Connecticut river at Northampton, and unites with the Farmington Canal, which traverses the state of Connecticut in its whole breadth, and terminates at New Haven, the entire length being 76 miles.

The Boston and Lowell Railroad, 25 miles, has a branch from Wilmington to Haverhill, 18 miles, and is extended to Dover in New Hampshire. From Lowell the railroad is continued through Nashua 15 miles to Concord in New Hampshire. There is a railroad from Boston to Newburyport, extended to Portsmouth, New Hampshire, and thence to Portland in Maine. There are also the Boston and Providence Railroad, 42 miles, with branches to Dedham, Taunton, and New Bedford; the Worcester Railroad, 43 miles, is a section of the Great Western Railroad, which is extended to Albany; and the Worcester and Norwich Railroad, 59 miles.

Manufactures, Commerce, &c.—The manufactures of this state are very large. The most important branch is the construction of ships; but the manufactures of cotton and woollen goods, of paper, leather, iron, and earthenware, are also very extensive.

The commercial relations of this state, both with foreign countries and the other states of the Union, are extensive and important. The chief articles of export are dried and salt fish, train and spermaceti oil, salted beef, flour, soap, candles, leather, timber, and cotton goods. The imports consist mostly of colonial goods from the West Indies, such as coffee, sugar, molasses, and indigo, together with the manufactured goods of England. The exports in 1840 amounted to 10,186,261 dollars; the imports to 16,513,858 dollars. By an agreement entered into with England in 1818, the inhabitants of the United States are permitted to fish cod on the western coasts of Newfoundland, the Straits of Belleisle, and the coasts of Labrador; and in this branch of fishery, together with that of the mackerel, more than 1000 vessels and boats belonging to Massachusetts are engaged.

Divisions and Towns.— Massachusetts is divided into 14 counties. The number of large towns in this state is now very great. The following are the most important, with the population of each in 1840:—*Amherst*, 82 miles W. from Boston, is the seat of Amherst College, a flourishing institution, which had, in 1848, 11 instructors, 150 students, and a library of 20,000 volumes. *Andover*, 21 miles N. from Boston, on the S.W. side of the Merrimac, is watered by the Shawsheen, which affords good water-power extensively employed in manufactures. Population, 5207. *Barnstable*, a seaport town, 74 miles S.E. from Boston, is situated on the south side of Barnstable Bay, which opens into Cape Cod Bay. Population, 4301. *Boston* is the capital of the state. [Boston.] *Cambridge* (8409 inhabitants), *Charlestown* (11,484 inhabitants), *Chelsea* (2290 inhabitants), *Dorchester* (4875 inhabitants), and *Roxburg* (9089 inhabitants), are all contiguous to Boston, of which they may be regarded as suburbs. [Boston.] Cambridge is the seat of Harvard University, which in 1848 had 20 instructors, 227 students, and a library of 82,000 volumes. *Danvers*, 16 miles N. from Boston, is a suburb of Salem. Population, 5020. *Dartmouth*, 65 miles S. from Boston, is situated on an inlet from Buzzard's Bay, and has a number of vessels employed in the whale fishery and coasting trade. Population, 4135. *Dedham*, 13 miles S.S.W. from Boston, is situated on the Charles River, which affords good water-power. Population, 3290. *Fall River*, 51 miles S. from Boston, is situated on both sides of the Fall River at its entrance into Mount Hope Bay, a branch of Narraganset Bay. The river affords a splendid water-power, which drives many factories, and the town has also considerable shipping employed in the whale fishery. Population, 6738. *Gloucester*, 30 miles N.E. from Boston, on the south side of Cape Anne, has a spacious and safe harbour, and the inhabitants are extensively employed in navigation and the fisheries. Population, 6350. *Lexington*, 11 miles N.W. from Boston, is a small town, which only requires notice as the place where the first blood was shed on the breaking out of the Revolution, eight men having been killed by the British, April 19, 1775, on the spot where a monument has been erected to record the event. Population, 1642. *Lowell*, a city, 25 miles N.N.W. from Boston, had in 1830 a population of 6474, which in 1844 had increased to 25,163, of whom about one-third are employed in the cotton and woollen manufactures. Lowell is situated on the south bank of the Merrimac, where the Concord River flows into it. A canal extends from the Merrimac, just above the Pawtucket Falls, in a sweep of a mile and a half, to the Concord River near its entrance into the Merrimac. A descent of 32 feet is accomplished by 4 locks, and into this canal the whole stream

of the Merrimac might be turned, thus affording an immense water-power, perfectly under control, to be applied to manufacturing purposes. Between 30 and 40 mills are driven by the Pawtucket Canal. The manufactures are chiefly sheetings, flannels, drillings, prints, shirtings, carpets, rugs, broadcloths, water-proof woollens, and kerseymeres. The bleacheries, print-houses, and dye-houses are in proportion to the quantity of goods manufactured. In 1840 Lowell contained 29 public free schools, besides a high school and 8 grammar schools. *Lynn*, 9 miles N.E. from Boston, on the shore of Massachusetts Bay, is a favourite place of resort for bathing in the summer season. Population, 9367. *Marblehead*, 18 miles N.E. from Boston, situated on a rocky projection in Massachusetts Bay, is chiefly inhabited by fishermen. Population, 6575. *Nantucket*, 119 miles S.S.E. from Boston, situated on the north side of Nantucket Island, at the bottom of the bay, has an excellent harbour. The houses are mostly of wood. In contains 9 churches. Population, 31,915. *New Bedford*, 55 miles S. from Boston, with which it is connected by a railroad, is situated on the west side of the Acushnet River, near the western extremity of Buzzard's Bay. It contains a town-house built of granite, a court-house, custom-house, and 18 churches. The inhabitants are much engaged in the whale fishery. Population, 12,087. *Newburyport*, 38 miles N. by E. from Boston, is situated on the south bank of the Merrimac, at its entrance into the Atlantic. The custom-house is of granite, with a Doric portico. Population, 7161. *Northampton*, 93 miles W. from Boston, situated on the west bank of the Connecticut, was incorporated as early as 1654. Population, 3750. *Pittsfield*, 131 miles W. from Boston, is situated on the line of railroad from Boston to Albany. Population, 3747. *Plymouth*, a seaport, 38 miles S.E. from Boston, has a spacious but shallow harbour. The houses are chiefly of wood. Population, 5281. *Quincy*, 9 miles S. by E. from Boston, is distinguished for the granite hills, which rise in some places to the height of 600 feet. A railroad extends from the quarry 3 miles to the tide-water on Neponset River, and is the first railroad made in the United States. Population, 3486. *Salem*, a city and seaport, 14 miles N.N.E. from Bristol, was settled in 1628. It is situated on a tongue of land formed by two inlets from the sea called North River and South River. Over North River is a bridge 500 yards long, connecting Salem with Beverley, and South River forms the harbour, which does not admit loaded vessels drawing more than 12 feet of water. It contains a court-house, gaol, market-house, and 16 churches. Population, 15,082. *Springfield*, 91 miles W. from Boston, on the east side of the Connecticut, is watered by the Chickapee and Mill rivers. A bridge crosses the Connecticut, and the town contains one of the United States' arsenals; the armoury is about half a mile from the town. There are 18 water-wheels and several forges driven by the water-power of the Mill River. Population, 10,985. *Worcester*, 42 miles W. by S. from Boston, contains a court-house and 7 churches. The railroad from Boston to Springfield and Albany passes through it, and the Blackstone Canal connects it with Providence; besides which a railroad to Norwich, in Connecticut, is connected with steam-boats in daily communication with the city of New York. It is a place of very great thoroughfare. Population, 7947.

History and Constitution.—The first settlement was formed in 1620 at Plymouth, by about 120 families of non-conformists, who had fled to Holland, and thence proceeded to Cape Cod. The American revolution began in Massachusetts. The first constitution was formed in 1780, and was revised and modified in 1820. The legislature consists of 40 senators, elected for one year, and 356 representatives, elected for one year. The governor is also elected for one year. Massachusetts sends 2 senators and 10 representatives to Congress.

MASSE'NA, ANDRE', Prince of Essling, Duke of Rivoli, and Marshal of France, was born at Nice, May 6, 1758. Left an orphan at an early age, his education was greatly neglected. In 1775 he entered the army as a private soldier. After a diligent discharge of his duties for 14 years, he attained the rank of sergeant, but discouraged by this slow promotion, he retired to his native city, where he made an advantageous marriage. The breaking out of the French revolution recalled him to his former profession, and he was appointed adjutant-major of the battalion raised in the department of the Var, of which regiment he subsequently became colonel. In August 1793 he was made general of brigade, and general of division a few months afterwards. In the Italian campaigns of 1794 and 1795 he served under the generals Kellermann and Scherer. When Bonaparte assumed the command of the army in Italy he employed Masséna actively on all occasions of importance. The scenes of his principal exploits were Montenotte (9–11 April, 1796), Millesimo (14 April), Castiglione (29 June—5 July), Arcola (15–17 Nov.), and Rivoli (9 January, 1797). In February, 1798, he was appointed to the command of the army which, under General Berthier, was occupying Rome and the Papal States. Multiplied complaints of his avarice occasioned his recall, and he was left without employment till 1799, when the command of the armies of the Danube and of Switzerland was confided to him. In the direction of this campaign he evinced a military talent of the highest order. On the return of Bonaparte from Egypt, Masséna was employed by him to defend Genoa. He arrived there on February 18, 1800, and defended it against superior forces, and amidst the horrors of famine, till June 3. On the same day that Napoleon became emperor, Masséna was created a marshal of France. In 1805 he was again appointed to the command of the army in Italy. After the peace of Pressburg (Dec. 20, 1805), Masséna had the command of the army which was to conduct Joseph Bonaparte to Naples. In 1807 he was appointed to the command of the right wing of the army opposed to the Russians in Poland, and his services during this important campaign were rewarded by the title of Duke of

Rivoli. He greatly distinguished himself at Landshut and Eckmühl. At the battle of Essling the defence of the village of Aspern was confided to Masséna, and his services on that occasion were rewarded by the title of Prince of Essling. His operations also were highly effective at Engerdorf and at Wagram. In 1810 Marshal Masséna was appointed to the chief command of the army in Portugal. His exploits in this campaign have not added to his reputation as a general, while the frequent examples of his cruelty, avarice, and breach of faith, have left a deep stain upon his memory. One achievement, however—his masterly retreat into Spain after the failure of his attempts on the lines of Torres Vedras—has been the subject of the highest praise and admiration, as far as military skill was concerned.

Masséna was recalled from Spain in 1812. In 1813 he was sent to Toulon to take the command of the eighth military division, from which place he formally declared his adhesion to the Bourbons, on April 6, 1814, and was by them confirmed in his command. On the return of Napoleon from Elba, after some hesitation, he recognised his government. After Napoleon's second abdication he was appointed commander-in-chief of the national guard of Paris. Being a member of the Council of War which was assembled for the trial of Marshal Ney, he joined the majority of members in pronouncing for the incompetency of the court. He died April 4, 1817.

MASILLON, JEAN BAPTISTE, was born June 24, 1663, at Hières, in Provence, and at a very early age entered the Collège de l'Oratoire of that town. He took orders, and in 1696 was made director of the seminary of St. Magloire, at Paris. He preached two celebrated Lent sermons with great success before Louis XIV. and his court at Versailles. He was made bishop of Clermont in 1717. He died of apoplexy in 1742. His pulpit oratory was highly esteemed in France, and his sermons have great merit as compositions. The most interesting of his works, next to his sermons, are his 'Conferences.' Masillon's works were collected and published by his nephew, in 12 vols. 8vo., in 1745 and 1746.

MASSINGER, PHILIP, born at Salisbury, in 1584, was the son of one of the Earl of Pembroke's retainers. In 1602 he was entered at St. Alban's Hall, Oxford, by the earl of Pembroke, with the view of being educated to become that nobleman's chaplain; but his tastes inclining him to the study of poetry and romance, rather than to logic and philosophy, he was abandoned by his patron, and repaired to London, where we first hear of him as the author of the 'Virgin Martyr,' which appeared in 1622. There is evidence also that after Beaumont's death he assisted Fletcher in the composition of some of his plays. During the rest of his life Massinger was employed in writing plays, the last of which appeared only six weeks before his death, March 17, 1640, at his own house on the Bankside.

In 1759 a bookseller's edition of Massinger appeared, which was followed in 1761 by another; and in 1777 by a third, edited by Monck Mason. The best edition is that by Gifford, published in 1805.

MASSINISSA. [Numidia.]

MASSON, ANTOINE, was born at Loury, near Orleans, in 1636. As an engraver Masson appears to have been self-taught. He possessed great facility of execution, and he was one of the first artists who made a marked distinction in the textures of the objects which he engraved; he was also extremely successful in his mode of representing colour. His print of the Disciples at Emmaus has an additional value beyond its merits as an engraving, for, with the exception of that of Christ, all the heads are portraits. Many of Masson's other portraits have a peculiar interest also as representing a great portion of the most distinguished men during the reign of Louis XIV. His historical pieces are not numerous, but they are all excellent. Masson died at Paris, in 1700, being then engraver in ordinary to the king of France, and a member of the French Academy of Painting.

MASSOWA. [Abyssinia.]

MASTER OF ARTS. [Arts, Degrees in.]

MASTER OF THE ROLLS. [Chancery.]

MASTER of a Ship. [Ships.]

MASTER and SERVANT. [Servant.]

MASTERS IN CHANCERY. [Chancery.]

MASTICH, a resin which is extracted from the trunk and branches of the *Pistacia lentiscus* by incision. This tree grows in the Levant, and particularly in the island of Chios. Mastich is composed of two resins, one of which is soluble in dilute alcohol, and the other is not; this last constitutes from 1-5th to 1-12th of the whole weight of the mastich, and possesses very nearly the characters of copal, it being soluble in absolute alcohol, æther, and oil of turpentine; these liquids also dissolve mastich without leaving any residue. Mastich is principally employed as an ingredient in varnish, and as a temporary stopping for carious teeth.

MASTIFF, the name of a variety of dog of a very old English breed, now seldom seen in its original state of purity. This is the *Dogue de Fort Race* of Buffon and the French, the *Mastivus* of Ray, and the *Canis Molossus* of Linnæus. A true-bred mastiff is of considerable size, and very stoutly built. The head is well developed and large, the lips deep and pendulous on each side of the mouth, and the whole aspect noble. British mastiffs (though some think Bull-Dogs) were highly prized in ancient Rome for their prowess in the combats of the amphitheatre.

MASTODON, the name of an extinct genus of gigantic Pachydermatous Proboscidian Mammals (*Mastotherium*, Fischer), whose remains are found abundantly in the third and fourth, or Pliocene, divisions of the tertiary fresh-water deposits, and also, but less frequently, in the deposits of the second or Miocene period.

In the greater portion of their organisation the Mastodons must have closely resembled the elephants. The tusks, the proboscis, the general conformation of the body and the limbs, were very similar; and the principal distinction between the two genera was formed by the molar

teeth. These indeed were gradually pushed forward from behind as they are in the elephant, and displayed the same relative increase in proportion as the animal was advanced in life; but, unlike those of the elephant, their crowns exhibited on cutting the gum large conical points of a mammiform structure, whence the animal derives its name. As these conical points were worn down by mastication, the tooth presented disks more or less large according to the degree of attrition which it had undergone.

The ascertained species are tolerably numerous, but the remains of the *Great Mastodon, Mastodon giganteus,* Cuv., appear to have been the first that attracted attention. These occur in considerable abundance in North America. They gave rise to much speculation and much erroneous opinion, at first; for though the form and size of the molar teeth forbade the inference that they could have belonged to any of the large existing animals, the formidable appearance of the pointed conical tuberosities of the crowns led to conclusions directly the reverse of truth.

One of the principal deposits of Mastodon bones appears to have been the Big-Bone Lick in the north part of Kentucky, near the Ohio. None of the remains have the appearance of having been rolled, but seem to have been unmoved since the death of the animal; and it is worthy of remark that those which were found at the river of the Great Osages, which runs into the Missouri a little above its confluence with the Mississippi, were in a vertical position, as if the animals had been bogged or buried in the mud.

Buffon seems to have been the first who noticed the occurrence of these teeth in the Old World, and figures one alleged to have been found in Little Tartary, and given to him by the Comte de Vergennes. This is very large, having from eight to ten points, and weighing eleven pounds four ounces. He also figures another from the museum of the Abbé Chappe, said to have been brought from Siberia. Pallas announces another instance; and gives a figure of one from the Ural Mountains. Cuvier states that he for a long time thought that his *Mastodon giganteus* inhabited the Old Continent as well as America, but he confesses his doubts as to this point.

The following species have been named: *Mastodon giganteus, M. angustidens* (Europe, America?), *M. Andium* (Andes), *M. Humboldtii* (Concepçion, Chili), *M. minutus, M. Tapiroides, M. Turicensis, M. Avernensis* (Epplesheim, Puy de Dôme), *M. Elephantoides* (Irawaddi, Sewalik Mountains), *M. latidens* (Irawaddi, Sewalik Mountains), and *M. longirostris,* Kaup. Professor Owen has referred the teeth from the Norfolk crag to the last-named species.

Example—*Mastodon giganteus* (Cuv.), *Mammut Ohioticus* (Blum.), *Elephas carnivorous* (Gul. Hunter), *Mammoth* of William Hunter and of the Anglo-Americans. This animal must have equalled the elephant in height, but seems to have been longer and stouter in its proportion.

A magnificent skeleton of this species, as well as teeth and other relics in abundance, are contained in the British Museum.

MAS'U'DI', ABU'-L-HASA'N 'ALI' BEN-HUSEI'N BEN-'ALI', one of the most celebrated Arabian writers, was born, according to his own statement, at Baghdád, in the third century of the hejira, or the ninth of the Christian æra. Mas'údí was gifted with great talents, which he applied at an early age to learned pursuits. He gathered an immense stock of knowledge in all branches of science, and his learning was not mere book learning, but he improved it in his long travels through all parts of the East, Turkey, Eastern Russia, and Spain. Mas'údí died probably at Kahira (Cairo), in A.H. 345 (A.D. 956).

No Arabian writer is quoted so often, and spoken of with so much admiration by his countrymen, as Mas'údí, and, although only a small portion of his numerous and voluminous works is known to Europeans, there is sufficient to show that he deserves his reputation. An account of his works is given in the article Mas'údí, in the 'Penny Cyclopædia;' and a translation of the first seven chapters of Mas'údí's 'Meadows of Gold and Mines of Gems,' by Dr. Aloys Sprenger, has been published by the Oriental Translation Fund, London, 1841, 8vo.

MASULIPATAM, a seaport town of Hindustan, is situated on the eastern coast in 16° 10′ N. lat., and 81° 14′ E. long. About a mile and a half south-east from the town is a fort in the form of a parallelogram, 800 yards long by 600 yards broad, and a straight causeway, 2000 yards long, connects the fort with the town. There are manufactures of chintzes in the town and neighbourhood, considerable quantities of which are exported: they are much esteemed in Persia. This is almost the only part of the eastern coast of Hindustan on which the surf does not beat, and the harbour affords good anchorage for ships of 300 tons burthen. The French established a factory at this place in 1750. It was taken by assault in 1759 by the English, under Colonel Forde, and has since continued in our possession.

MATANZAS. [CUBA; HAVANNAH.]

MATARO'. [CATALUÑA.]

MATCH, in Gunnery, is a material employed in firing military mines or in discharging pieces of ordnance. Before the invention of fire-locks, hand-guns or small-arms were fired by matches, which the soldiers carried with them when on service; and matchlock fire-arms are still used in some parts of Asia.

What is called *slow-match* is only a piece of slightly twisted hemp which has been well soaked in a strong solution of saltpetre with boiling water. The materials employed in the formation of *quick-match* consist of a wick of cotton steeped in a mixture of saltpetre and mealed gunpowder with spirit of wine and rain-water.

MATCH-BOX. [ARMS.]

MATE'. [PARAGUAY TEA.]

MATERA. [BASILICATA.]

MATE'RIA ME'DICA is that branch of medical science which treats of the articles employed in the practice of medicine, and embraces an explanation of the nature and modes of action of those substances which are had recourse to in order to restore the healthy state of the human

frame when its functions or structures are impaired by disease. Thus defined it comprehends both *pharmacology* and *therapeutics*. The former means an account of drugs, simple or prepared, in reference to their physical character, natural history, commercial history, chemical composition, and modes of exhibition. The latter means an exposition of the principles which should regulate their employment.

MATERIALISM is a name applied to any philosophical system which denies the existence of a spiritual or immaterial principle in man, called the mind or soul, distinct from matter, or which (changing the phrase) denies the immateriality of the soul. The name is applied to systems which differ very widely from one another, in respect of the consequences deduced from the denial of the soul's immateriality: and thus it comes to pass that the popular meaning of the word has become loose and incorrect, comprehending what are no better than accidental consequences of the pure and proper idea. Such accidental consequences are the denial of a future state, and absolute atheism; and atheism and materialism are often treated in current conversation as convertible expressions.

The name materialism also is one of that sort for which Mr. Bentham has constructed the epithet *dyslogistic*. As applied in current conversation, it always carries with it censure. Indeed there is hardly a single word in the whole range of philosophic terminology better fitted to exemplify the evils of looseness of application, or of allowing feelings to tinge and discolour the notions conveyed by names.

The following is a brief summary of the views of Dr. Priestley, who has more formally than any other writer enunciated the principles of materialism in the pure and proper sense of the word. He denies the existence of a separate immaterial principle in man, called the mind or soul, because he thinks that an immaterial principle could not exist in union with the material body, and because he thinks further that all mental phenomena (as they are called) may be explained by means of supposed movements arising out of the bodily organization. The method by which he thus explains mental phenomena is that of Hartley. [HARTLEY.] But, denying the existence of a soul, separate from the body, and capable of surviving when the body perishes, he does not yet deny the immortality of man, and a future state of rewards and punishments. On the contrary, he distinctly affirms these on the authority of Scripture.

Materialism, even as it is expounded by Dr. Priestley, is devoid of philosophical foundation, and rests on a disregard of the limits of true philosophy. Its truth cannot be tested by observation. It rests altogether on hypothesis and conjecture. When we go beyond what are called the qualities of the mind, or of matter either, and speculate upon what it is itself, whether it is something else, or differing from that something, whether it has or has not an existence, we have no help but in supposing, and conjecturing, and imagining.

The converse of the word materialism is immaterialism. This is used only as an abstract term, and even thus very seldom; spiritualism being generally used in its place.

MATERIALS, STRENGTH OF. The strength of any material object, as a rod, bar, beam, chain, or rope, is that power by which the substance resists an effort to destroy the cohesion of its parts.

Whatever be the constitution of a rod or beam, the relation between its strength and the strain to which it may be exposed can be made the subject of mathematical investigation only by imagining the material to consist of an infinite number of particles arranged in lines (like fibres or threads) parallel to each other in the direction of its length. The particles in each line must be supposed to cohere together by powers exerted in that direction; and the several lines to cohere laterally with forces which may, or may not, be equal to those exerted longitudinally.

A rod of any material, consisting of parallel fibres as above supposed, being placed in a vertical position, and strained by a weight applied at the lower extremity, the particles in every fibre will be separated from each other by the action of the weight, and consequently the length of the rod will be increased. The cohesive power by which the particles are kept together will, in most cases, be diminished by the separation; and if the weight be sufficiently great, or if it be allowed to act during a sufficient length of time, the cohesive power will be certainly overcome; that is, the rod will, in some parts of its length, be torn asunder.

If the materials were perfectly elastic, so that the length of the rod became the same, after the removal of the suspended weight, as before that weight was applied, the force of cohesion would evidently be proportional to the intensity of the straining power; and this is generally adopted as an hypothesis in investigations concerning the equilibrium between strengths and strains; it being understood that the latter have only that moderate degree of intensity, compared with the former, which is consistent with the permanent stability of the edifice or machine. The same law is considered to hold good when the particles of an elastic body are made to approach each other by the action of a compressing force like that of a weight on the top of a vertical pillar.

If a body be strained by a weight acting in the direction of its length, its strength is proportional to the area of a transverse section. Thus if F (which may be determined by experiment) designate the cohesive power in a unit of such area, as a square inch, a square foot, &c.; also if A represent the area, and W the weight applied, including that of the body itself, we should have $F.A = W$ when the strength and strain are in equilibrio.

For complete details concerning the experimented values of F, the reader must be referred to the extensive tables which have been published by Barlow ('Essay on the Strength of Timber'); Rennie ('Phil. Trans.,' 1818); Tredgold ('Principles of Carpentry'); and Hodgkinson ('Man-

chester Memoirs,' vol. iv.), our limits permitting us to introduce only the few determinations which follow.

The area of a transverse section of each rod is one square inch, and the values of F are expressed by the breaking weights in pounds avoirdupois.

English oak	F=	8,000 to 12,000
Fir		11,000 to 13,488
Beech		11,500
Mahogany		8,000
Teak		15,000
Cast-steel		134,256
Iron-wire		93,964
Swedish bar-iron		72,064
Cast-iron		18,656 to 19,488
Wrought-copper		33,792
Platinum-wire		52,987
Silver do.		38,257
Gold do.		30,888
Zinc do.		22,551
Tin do.		7,129
Lead do.		3,146

Rope (1 inch circumf.) bore 1,000 lb., F=12,566

Whale-line spun by hand (2 in. circumf.)	2,240	,,	7,037
Do. by machinery ($1\frac{7}{8}$ in circumf.)	3,520	,,	12.582
Rope (3 in. circumf.)	5,628	,,	7,858
Do. (4 in. circumf.)	9,988	,,	7,845
Cable ($14\frac{1}{2}$ in. circumf.)	89,600	,,	5,355
Do. (23 in. circumf.)	255,360	,,	6,066

According to the experiments of Mr. Barlow it appears that a bar of malleable iron is extended one ten-thousandth part of its length by a direct strain equal to one ton for each square inch in the area of the transverse section: when stretched with ten tons per inch its elasticity was injured, or the bar did not return to its original state.

The strength of a pillar when compressed by a weight acting in the direction of its length must depend upon the area of a transverse section of the pillar: but since, besides the displacement of those particles from the longitudinal pressure, their lateral cohesion must be overcome before they can be thrust outwards, it is evident that the strength is not proportional to the area, simply, but to some function of that area. No law on which any dependence can be placed has yet been discovered for the strength of a pillar in such circumstances; but late engineers have supposed that the square root of the third power of the area represents it nearly.

The following table of the strength by which materials resist this kind of force, when just crushed by the pressure, is extracted from the account of experiments made by Sir John Rennie; but the weights found from the experiments are here reduced to those which might have crushed the materials, if the latter had been formed into prisms having the area of the transverse section equal to one square inch:—

		lbs.
Elm	crushing weight	1,284
White deal	,,	1,928
Oak	,,	3,860
Chalk	,,	334
Red brick	,,	538
Portland stone	,,	3,047
Limestone	,,	5,903
Aberdeen granite	,,	7,276
Cast-iron	,,	681,376

The following table contains a few of the results obtained from experiments made by Messrs. Banks, Barlow, and Tredgold, on wood and iron, when supported loosely on props and subject to a transverse strain at the middle point. The second column contains the length of the beam or bar in feet; the third, the areas of the transverse sections in square inches; the fourth, the breaking weights in pounds; and the last, the deflections at the middle points in inches.

	l	a	W	Δ
Young oak (English)	2	1	482	1.87
Ship timber	$2\frac{1}{2}$	1	264	1.5
Oak (English)	7	4	637	8.1
New England fir	7	4	420	4.66
Riga fir	$2\frac{1}{2}$	1	212	1.3
Teak	7	4	820	4
Cast-iron bars	3	1	756	
Ditto	3	1	869	

Since the strengths of beams attached at one end or supported on props, the other dimensions being the same, vary as the squares of the vertical depths, it follows that the most advantageous position, when the areas of the transverse sections are equal, is that in which the broadest surface is in a vertical position. In this manner girders and joists in edifices are invariably placed.

When a beam or bar is attached at one end to a wall, or when it turns upon its middle point like the great lever of a steam-engine, if it be required that the beam should be equally strong in its whole length, it should be made to taper towards its extremities. When the depth of the beam is constant, the breadth at any point should be proportional to its distance from the extremity. When the breadth is to be constant, the vertical face of the beam should have the form of the common parabola; and when both breadth and depth vary, a longitudinal section of the beam should have the figure of that which is called a cubical parabola.

If a weight be applied at any point in the length of a beam which is supported on two props, the strain produced by it will be the greatest when it is placed in the middle; and the strain varies as the product of the distances of the weight from the points of support. This product, and consequently the strain, is a maximum when the weight is in the middle of the beam.

If a weight be diffused over a beam which is fixed at one end to a wall, it may be considered as acting at its centre of gravity, which, if the diffusion be uniform, will be in the middle of the length of the beam. The momentum of the strain will consequently be equal to half of that which would result from an equal weight attached to the opposite end.

When a body is compressed in a direction perpendicular to the length of the fibres, the points of support being very near and on opposite sides of the place at which the force is applied, the strain to which the body is then subject has been called by Dr. Young the force of detrusion. This

species of strain sometimes occurs in the construction of machinery; but few experiments have yet been made to determine the strength by which materials resist it. From these however it appears that the strength is proportional to the area of the transverse section, and that it varies from four-thirds to twice the strength by which the same material would resist a strain in the direction of its length.

Such machines as capstans and windlasses, also axles which revolve with their wheels, are, when in action, subject to be twisted, so that their fibres tend to become curved in oblique directions: the strain thus produced is called that of torsion, and the strength of a solid cylinder to resist this kind of strain is found to be proportional to the cube of the diameter. The ratio between the strength by which a material resists the strain of torsion, and that by which it resists a strain extending it in the direction of its fibres, is as the diameter of a circle is to twice its circumference. Since the strain of torsion depends on the diameter of the cylinder, it is evident that a hollow cylinder must be stronger than a solid one; the areas of the material in the transverse sections being equal to each other.

MATHEMATICS (*μάθησις*, or *μάθημα*), a name given in the first instance to a branch of knowledge, not as descriptive of its subject-matter, but of the methods and consequences of learning it. The word *μάθησις*, and the Latin *disciplina*, by which it has been rendered, have been the origin of the vernacular terms *mathematics* and *discipline*, the meanings of which have long since separated. The properties of space and number, the subject-matters of the *μάθησις*, have usurped the name; so that anything which relates to them, however learnt, is called mathematics: the Latin word, on the contrary, still retains the signification of a corrective process; and, in speaking of any branch of knowledge, is applied when power of mind is derived from the methods of learning it, as well as knowledge from the results.

The distinction between the old and new meaning of mathematics is most requisite to be kept in mind, because arguments are frequently urged for and against mathematics, in which the discipline is confounded with the communication of facts and processes about space and number.

In the time of Plato, which was probably that of the application of words which imply '*the* discipline' to that one exercise of mind which consists in making deductions by pure reasoning from the self-evident properties of space and number, it is probable that such restriction of the word was easily justifiable. At present we have, besides mathematics, physics, the study of antiquity, grammar, &c., which have all been made disciplines, but no one of which was then entitled to that appellation. Nevertheless it has happened that writers, misled partly by the name of mathematics and partly by the pre-eminence of mathematical reasoning in strictness and connection, have spoken as if it were the only cultivator of the pure reasoning power.

Much discussion has arisen upon the question whether those primary propositions which, from our clear apprehension and willing admission of them, are called self-evident, are notions inherent in the mind, or deductions of early experience. Except to mention this controversy, we have here nothing to do with it. The certainty of these propositions is all that we want, and this is conceded by both sides. The consideration however of the fundamental supports of mathematical reasoning is useful and interesting, and, as a safeguard, even necessary. It is not long since a school of metaphysicians existed, who imagined that because all mathematical definitions are precise, therefore the exact sciences are founded upon definition. It was not to them a necessary result of the constitution of our faculties that the three angles of every triangle make up the same amount, but a consequence of definition, which might have been something else, upon different suppositions. We can hardly undertake to explain what we do not understand, but we recommend every beginner in the subject to seek no knowledge about the character of fundamental propositions until he shall have become well acquainted with their consequences. He must take care to admit nothing which is not, or cannot be made, most evidently true; and he will find that all axioms, as they are called, have the highest sort of certainty, namely, that they cannot be imagined otherwise.

Whatever may be the metaphysical hypothesis to which it is referred, it is certain that there is a real distinction between a mathematical assertion and one of any other kind. If we say that an unsupported bit of lead will fall to the ground, we state a fact of which we are as certain, in the sense of reliance, as we are of the other proposition that two straight lines cannot inclose a space. But in the former proposition, an exception, or even a permanent alteration of the law, is conceivable by the imagination: in the latter the mind would feel sensible of absurdity if it attempted to construct the idea of an inclosure bounded by only two straight lines. No distinctive phrases can be too strong to express the essential difference of these two assertions; but it is a misfortune that all terms which create a sufficient distinction are linked to one or another theory of the human mind. If the mathematical student can receive these terms as indicative of the difference of species, without bending before an hypothesis about the conformation of his own reason, he will do well to adopt them; if, on the other hand, he feel compelled to agree with any one system of mental philosophy, he will neither impede nor advance his mathematical career.

The sciences of which we speak may be considered either as disciplines of the mind, or as instruments in the investigation of nature and the advancement of the arts. In the former point of view their object is to strengthen the power of logical deduction by frequent examples; to give a view of the difference between reasoning on probable premises and on certain ones, by the construction of a body of results which in no case involve any of the uncertainty arising from the previous introduction of that which may be false; to form the habit of applying the attention closely to difficulties which can only be conquered by

thought, and over which the victory is certain if the right means be used; to establish confidence in abstract reasoning by the exhibition of processes whose results may be verified in many different ways; to help in enabling the student to acquire correct notions and habits of generalisation; to give caution in receiving that which at first sight appears good reasoning; to instil a correct estimate of the powers of the mind, by pointing out the enormous extent of the consequences which may be developed out of a few of its most inherent notions, and its utter incapacity to imagine, much less to attain, the boundary of knowledge; to methodise the invention of the means of expressing thought, and to make apparent the advantages of system and analogy in the formation of language and symbols; to sharpen the power of investigation, and the faculty of suggesting new combinations of the resources of thought; to enable the historical student to look at men of different races, opinions, and habits, in those parts of their minds where it might be supposed *à priori* that all would most nearly agree; and to give the luxury of pursuing a study in which self-interest cannot lay down premises nor deduce conclusions.

As instruments in the investigation of nature and the advancement of the arts, it is the object of the mathematical sciences to give correct habits of judgment and ready means of expression in matters involving degree and magnitude of all kinds; to teach the method of combining phenomena, and ascending from the complicated forms of manifestation to the simple law which regulates them; to trace the necessary consequences of any law, assumed on suspicion, in order to compare those consequences with phenomena; to construct hypothetical representations of laws, or approximations to laws, which shall sufficiently represent phenomena; to convert processes of known accuracy, but complicated operation, into others which make up in simplicity for a certain amount of inaccuracy, and to devise means for judging of that amount of inaccuracy, and confining it within given limits; to ascertain the most probable result of observations or experiments which are discordant with each other either from errors of measurement or unknown causes of disturbance; to point out the species of experiments which should be made to obtain a particular sort of information, or to decide between two laws which existing phenomena both indicate as of nearly equal credibility; to make all those investigations, which are necessary for the calculation of results to be used in practice, as in nautical astronomy, application of force and machinery, and conduct of money transactions; in a word, though that word by itself would not have presented a sufficiently precise idea, to find out truth in every matter in which nature is to be investigated, or her powers and those of the mind to be applied to the physical progress of the human race, or their advancement in the knowledge of the material creation.

The main branches of mathematical science were formerly stated to be arithmetic and geometry, springing out of the simple notions of number and space. This is too limited a description. Unquestionably the science of numbers, strictly and demonstratively treated, and that of geometry, or the deduction of the elementary properties of figure from definitions which are entirely exclusive of numerical considerations, must be considered as the elementary foundations, but not as the ultimate divisions, of mathematics. To them we must add the science of operation, or algebra in its widest sense,—the method of deducing from symbols which imply operations on magnitude, and which are to be used in a given manner, the consequences of the fundamental definitions. The leading idea of this science is operation or process, just as number is that of arithmetic, and space and figure of geometry: it is of a more abstract and refined character than the latter two, only because it does not immediately address itself to notions which are formed in the common routine of life. It is the most exact of the exact sciences, according to the idea of their exactness which is frequently entertained, being more nearly based upon definition than either arithmetic or geometry. It is true that the definitions must be such as to present results which admit of application to number, space, force, time, &c., or the science would be useless in mathematics, commonly so called; but it is not the less true that a system of methods of operation, based upon general definitions, and conducted by strict logic, may be made to apply either to arithmetic or geometry, according to the manner in which the generalities of the definition are afterwards made specific.

The most important question connected with the mathematical sciences, is the manner in which they should be taught as disciplines of the mind. This concerns all who consider any branch of knowledge in that light; and, as education spreads, this view of the subject will become of more and more consequence. Vitally essential as these sciences are to the advancement of the arts of life, we feel, in regard to this branch of their utility, in the situation of those who know that they must and will be attended to, because their cultivation is necessary to the supply of wants which all can feel, and the promotion of interests which all can understand. It is not so with the first-mentioned object of their study, but rather the reverse; for the wants of life being as easily supplied by the results of an illogical as of a logical system (provided only that vicious reasoning be not allowed to produce absolute falsehood), the facilities which laxity of reasoning affords in the mere attainment of results will always recommend it to those whose main object it is to apply the fruits of calculation to the uses of life. Such has been, and, we are afraid, will continue to be, the tendency of the great advance which the last century made in application.

All we should positively contend for is the necessity of making the entrance to the study as strict and rigorous as reason can make it, to all who are to receive liberal education. In the higher branches of mathematics many opinions prevail, and it would be impossible to make a formal standard of rigour. Add to this, that with a certain degree of experience in the

estimation of reasoning, it may be comparatively immaterial which of several different methods is adopted; either may be rigorous if properly understood, and if the habit of reducing looseness of phraseology, or dangerous abbreviation of logic, to strict definition and formal deduction, shall first have been well formed. To assist in gaining this end, we shall propose—

First, that no student should be allowed to enter upon the use of language in mathematical reasoning until he has acquired more acquaintance with the nature of assertion, denial, and deduction, than can be obtained from previous education as now given: this to be done by the study of the elements of logic.

Secondly, that no consideration of facility or practical convenience should prevent the first study of arithmetic and geometry from being strictly demonstrative, and formally rigorous: rigour being defined to consist in explicit statement of every assumption, and logical treatment of every inference.

On the first of the preceding recommendations we shall only observe, that in order to distinguish between accurate and inaccurate inference, an acquaintance with the exact extent of meaning of the several modes of communication is absolutely necessary. This cannot be learnt from the ordinary use of language, which abounds in implications to be suggested by the circumstances of the speaker, the context of the words, or the tone in which they are delivered. Before the phrases of demonstration can be made to convey a meaning limited in both directions, the strict use of language must be made a study; if this be neglected, the words of any book may pass between the teacher and the learner, but no precaution has been taken to secure their conveying the proper meaning, neither too much nor too little.

On the second recommendation, we must first explain that we hold many points of controversy very cheap, as far as they concern the discipline given by the most elementary branches of mathematics. It matters nothing, in our view of the case, whether an axiom be really incapable of proof, or whether the substitution of another would or would not place the science on a more simple basis. The habit to be formed is that of tracing necessary consequences from given premises by elementary logical steps: the premises to be true or false, the consequences to be true if the premises be true, and dubious (not necessarily false) if the premises be false. The only error which, at the stage in question, it is intended to avoid, is the deduction, as a necessary consequence, of that which is not so. The mind of the learner however is allowed to dwell too much at the outset on the absolute truth or falsehood of the conclusions, to the neglect of their connection with the premises: hence it arises that when a process occurs in which it is essential to examine that connection for its own sake, it is the universal complaint that beginners find difficulty and obscurity. From what other cause arises the dislike of the indirect demonstration? [Absurdum, Reductio ad.]

Unfortunately for the mental progress of the student, he is often allowed to use premises of an easy form, in cases where a complete preparation for the subject would require more extended first principles, and greater prolixity of deduction. To this, as before observed, no objection can be taken in itself, provided that no consequences be admitted except the legitimate ones. But something more *is* admitted: the pupil is presented, in consideration of his attention to one set of premises, with the consequences of another, and is allowed to make believe that he has come fairly by the latter. Thus, by a theory which applies only to the ratio of number to number, he is permitted to draw general conclusions upon all ratios. When, in opposition, we advise that the first studies should be demonstrative and rigorous, we do not imply, for instance, that the more difficult system should in all cases be preferred to the less complete but more simple: we confine ourselves to insisting that whatever the premises may be, the conclusions should really follow; and that if the latter be necessarily of a limited character, the limitation should be stated.

The necessity of a demonstrative system of arithmetic is practically denied, in this country at least, by the use of a set of dogmatical rules. Such training would be less prejudicial if the notions of the student on reasoning were more settled, so that he could receive these rules with some fitting idea of their purpose, and of the extent to which they are to be considered as knowledge. As it is, he has no other view of arithmetic presented to him, and his conceptions of number are allowed to be first fettered, and afterwards led astray, by ideas derived sometimes from the reception of the conventional for the necessary, sometimes from modifications of truth which are convenient in practice though unsound in theory. Such an addition to his stock of mathematical power predisposes him to acquiesce in the shifts by which rigour is avoided in other parts of the science; and an arithmetic from which both sequence and accuracy of thought have been excluded is the asylum of geometry against truth when the latter becomes too difficult for an unenergetic, that is untrained, power of investigation.

MATHEWS, CHARLES, was born June 28, 1776. His father intended him for a bookseller, but the son felt an irresistible inclination for the stage, and after several successful provincial appearances, appeared at the Haymarket Theatre, London, in 1803. He subsequently became celebrated and popular in those original entertainments called 'At Homes,' which he gave both in England and America with extraordinary success. He died June 28, 1835, at Plymouth. He ranked high as a comedian and a mimic.

MATHI'OLA, a genus of cruciferous plants consisting of annual and perennial herbaceous plants inhabiting the warm countries bordering the Mediterranean, and extending eastwards into Persia and some of the southern Asiatic provinces of Russia. Between thirty and forty species are known to botanists, among which are those which form the Stocks and Gilliflowers of gardens, sweet scented biennials much valued for the

beauty and variety of their many-coloured flowers. The principal source of these has been *Mathiola incana*.

MATICA or MATICO. This name is applied to an astringent plant brought from Peru, where it has long enjoyed a high reputation for its styptic properties. Doubts exist as to the botanical origin of the plant. Cold water extracts, in about four hours, all the medicinal virtues of the plant, and is an eligible means of administering it. A tincture is also employed, and the powdered leaves are given both internally and applied externally. It does not owe its astringent properties to tannin: and it seems to exert a vital action on bleeding vessels, so as speedily to arrest the hæmorrhage. It has been used to check other discharges, such as the profuse expectoration and also the night-sweats of consumptive patients. Few drugs exert more than a temporary influence over these symptoms; but, among such, Matico seems well entitled to attention.

MATLOCK. [Derbyshire.]

MATRASS, a glass chemical vessel, employed for the purpose of digesting, boiling, and distillation.

MATRICA'RIA, a genus of plants belonging to the natural order *Compositæ*. *M. Chamomilla*, Wild Chamomile, is common throughout Europe, on dung-hills, in cultivated ground, and on waysides and waste places. It was formerly used as a medicine, but its place has been taken by the common Chamomile and other plants of the same order.

MATRIX, or GANGUE. Metallic ores are seldom found unmixed in the place in which they occur; they not only accompany each other, but are frequently associated with useless stony bodies, and these are called the matrix, or gangue.

MATSYS, QUINTIN, was born at Antwerp in 1460. A romantic story has gained credence of his having abandoned his trade of blacksmith because the father of his betrothed refused to give his daughter to any other than a painter. His most remarkable and best known pictures are—the 'Two Misers,' of which there are numerous copies (the picture in the Royal Gallery at Windsor is supposed to be the original); a 'Magdalen,' at Corsham House, Wilts; and a 'Descent from the Cross,' in the Antwerp Museum. His drawings are extremely rare. He died at Antwerp in 1529.

MATTER is the name for that out of which all objects external to the mind are thought to be composed, the question being reserved, whether the mind is or is not composed of the same substance. What this substance is to which the name of matter is given, we have no means of knowing. It is sufficient to know and say that man, subject to certain affections of his senses, is led to assign those affections to an external cause. This external cause is that which he calls matter; but all that is known of it is its capability of producing in him certain affections. When therefore we speak of the qualities of matter, we do not affect to say what that is which is the *substratum* of those qualities.

MATTHEW, ST., the Apostle and Evangelist, was a native of Galilee, and a publican, or collector of customs and tribute under the Romans. While employed in his office at Capernaum he was called by Christ to follow him (Matt. ix. 9). The only further certain information which we possess concerning him is in the gospels. He is said to have preached the gospel subsequently in Persia and in Ethiopia, and to have died or been martyred at Naddabar in Ethiopia. An account which corresponds in all respects to that of the conversion of Matthew as related by himself is given by Mark (ii. 14), and Luke (v. 27), respecting a publican named Levi, the son of Alphæus.

'*The Gospel according to St Matthew*,' is a canonical book of the New Testament, ascribed by the unanimous consent of the early Christian writers to the apostle Matthew. [Gospel.] It is generally considered to have been the first written, and most writers have fixed the date of this gospel about A.D. 38. There has been much discussion as to the language in which it was originally written, whether Hebrew or Greek. There may have been two originals, one in Hebrew for the Jewish converts, and one for general use in Greek. If there was only one, the probability is that it was in Greek.

MATTHEW OF WESTMINSTER, a monk of Westminster, and an old Latin chronicler of the time of Edward II. His work which has come down to us is entitled 'Flores Historiarum.' He begins with the creation, and the first half of the work is filled with the affairs of other countries, and of our own before the Conquest; the remainder contains a valuable account of our history from that period to the death of Edward I.

MATTHISSON, FRIEDRICH VON, was born at Hohendodeleben, near Magdeburg, Jan. 23, 1761. In 1794 he obtained the appointment of reader and travelling companion to the reigning princess of Anhalt-Dessau, and during the next seven or eight years visited Italy, the Tyrol, and part of Switzerland, relative to which countries his 'Briefe' and his 'Erinnerungen' furnish many interesting details. His fame rests however on his 'Elegy in the Ruins of an Old Castle' which is hardly less popular than that of Gray is with us, as is also his song of 'Adelaide,' with music by Beethoven. Matthisson also performed a good office for the poetical literature of his country by his 'Lyrische Anthologie,' a collection in 20 vols., published at Zürich, 1805–7. He died at Wölitz, near Dessau, March 12, 1831.

MATTINS (from the Italian *mattina*, or the French *matin*, morning), strictly the first part in the daily service of the Roman church. Matins or mattins however were divided into two parts, which were originally distinct offices and hours, namely, the *nocturn* and *matin lauds*. The *nocturns* or vigils were derived from the earliest period of Christianity. They originated in the endeavours of the early Christians to avoid persecution, by performing their 'holy mysteries' at night. The custom was afterwards retained from devotion and choice. The *matin lauds* followed next after the nocturns, and were supposed to begin with daybreak. We find allusions in the writings of Cyprian, and all the subsequent fathers, to the morn-

ing as an hour of prayer. About the end of the third or beginning of the fourth century there was public worship in the morning, as we learn from the 'Apostolical Constitutions,' where we have the order of the service.

MATTO GROSSO. [Brazil.]

MATY, MATTHEW, M.D., was born in Holland in 1718, at Montfort, near Utrecht. He took his degree at Leyden and came to England in 1740. Through the popularity of his 'Journal Britannique' he was introduced to the leading literary men of the day, and had interest sufficient to raise him at last to be principal librarian of the British Museum in 1772. He died in 1776. His works are 'Mémoire sur la Vie et sur les Ecrits de M. Ab. de Moivre;' 'Authentic Memoirs of the Life of Richard Mead, M.D.' At the time of his death he had nearly finished the 'Memoirs of the Earl of Chesterfield,' which was completed by his son-in-law, Mr. Justamond, and prefixed to that nobleman's 'Miscellaneous Works.'

MAUBEUGE. [Nord.]

MAUCHLINE. [Ayrshire.]

MAULE'ON. [Pyrene'es, Basses.]

MAUNDY THURSDAY, the Thursday preceding Easter, so named from the *maunds*, or baskets, in which the alms or gifts made to the poor by our kings or queens were formerly contained. These gifts were distributed to as many poor men and poor women as the monarch numbered years, and consisted of victuals, clothing, and money. The lord high almoner, and sometimes the monarch, washed the feet of a certain number of the poor. James II. was the first who performed this ceremony. In 1838 a change was made in the maundy men and women receiving money from the clerk of the almonry office instead of the accustomed fare.

The custom of the maundy is of considerable antiquity. Augustine, according to Du Cange, is first quoted for it. In England at least it was not entirely confined to royalty. In the Earl of Northumberland's 'Household Book,' begun in 1512, fol. 354, we have an enumeration of 'Almaner of things yerly yeven by my lorde of his maundy, ande my laidis and his lordshippi's childeren.'

MAUPERTUIS, PIERRE-LOUIS MAREAU DE, was born at St. Malo, 17th July, 1698. Upon quitting the army, he applied himself assiduously to the study of the mathematics and astronomy. In 1723 he was admitted a member of the Royal Academy of Paris, and in 1727 a member of the Royal Society of London. In 1736, Maupertuis, in company with Clairaut, Camus, Lemonnier, and Outhier, were deputed by the Academy to measure an arc of the meridian in Lapland. They were afterwards joined by the Swedish astronomer Celsius.

Maupertuis was one of the first among his countrymen who defended the Newtonian theory against the attacks of Descartes. When Frederic II. was about to re-organise the Academy of Berlin, he offered the presidency to Maupertuis, who accepted it. But his residence at the court of Prussia, which dates from 1745, seems to have been chiefly occupied in cultivating the good graces of Frederic, and he showed little interest as to scientific research except such as had reference to his survey in Sweden. His vanity on this point was conspicuous. In the portrait which he had painted of himself he is represented in the act of compressing the poles of the earth. He died at Basel, 27th July, 1759, at the house of two of the sons of John Bernoulli, with whom he had always been on terms of friendship. His latter years were embittered by a dispute with Koenig, professor of mathematics at the Hague and foreign associate of the Academy of Berlin, respecting a mechanical principle of considerable importance, which Maupertuis appears to have been the first to promulgate, and from which he deduced the laws of the reflexion and refraction of light, and those to which the collision of bodies are subjected, but of which he was unable to give any general demonstration. This principle, which he designated 'the principle of least action,' he enunciated in terms identical with those employed at the present time. The Academy of Berlin, to whose arbitration the dispute was referred, decided in favour of Maupertuis, and ordered the name of Koenig to be erased from their list of associates; but even this decision, added to the support of the celebrated Euler, seemed inadequate to compensate Maupertuis for the raillery of Voltaire, who, although totally incompetent to judge on the scientific merits of the case, had taken the part of Koenig, and published his satirical piece entitled 'Diatribe du Docteur Akakia, Médecin du Pape,' wherein he was too successful in turning into ridicule both Maupertuis and his 'principle.' Frederic, who disliked Maupertuis, laughed at the satire, but ordered it to be burnt by the common executioner, which led to Voltaire's asking and obtaining permission to leave Berlin ('Vie de Voltaire,' par Condorcet.) A list of the published works of Maupertuis is given in Quérard's 'Dictionnaire Bibliographique.'

MAUR, ST., CONGREGATION OF, a celebrated society of Benedictines in France who professed to follow the primitive rule of that order. It was first established in 1618. Among its more eminent members in the seventeenth century may be enumerated Hugh Menard, Luc d'Acheri, Jean Mabillon, Thierri Ruinart, and Bernard de Montfaucon. Moreri gives a list of the generals-superior of this congregation from 1630 to 1756.

MAURA, SANTA. [Santa Maura.]

MAURIAC. [Cantal.]

MAURICE OF NASSAU. [Nassau, House of.]

MAURICE, ELECTOR AND DUKE OF SAXONY, son of Duke Henry of Saxony, and grandson of Albert, surnamed the 'Courageous,' the founder of the Albertine line, a younger branch of the electoral family, was born in 1521. In 1541 he married Agnes, daughter of the Landgrave of Hesse. Although a zealous Protestant, as his father had been, Maurice did not scruple to serve as a volunteer under the Emperor Charles V. Ambition, says Voltaire, led him to second the views of the emperor, as ambition led him afterwards to denounce them

This did not prevent him however from paying attention to home affairs. The laws which he established in 1543 are remarkable for their religious and moral bearing. Nor was he wholly under imperial domination; for when in 1542, at the suit of Henry, Duke of Brunswick, who had been driven from his dominions, he was cited with the Landgrave and the other confederates to appear before the Imperial Chamber, they publicly refused to acknowledge the jurisdiction of that court, while composed entirely of men of a hostile religion, and who had publicly declared against keeping faith with 'heretics.'

On the breaking out of the war in 1545, between the Duke of Brunswick and the Landgrave of Hesse, the former applied to Maurice to intercede with his father-in-law to obtain peace. After repeated solicitations, Maurice induced the Landgrave to offer terms; but the terms offered involved so complete a submission on the part of the duke that they were indignantly rejected, and the war broke out afresh. It terminated however in the defeat of Brunswick, who, through the mediation of Maurice, was induced to surrender. Maurice was accused of having acted a treacherous part in this transaction, and betrayed the duke; but he successfully cleared himself from the charge.

In 1546 on the breaking out of the war between the Emperor and the Protestant confederates, John Frederick, Elector of Saxony, and the Landgrave of Hesse appeared on the latter side, for which they were duly outlawed by imperial authority. Meantime, Maurice had been secretly negociating with the Emperor and Ferdinand of Spain, the former of whom, as an inducement to support his cause, invited Maurice to take possession of the Electorate of Saxony. Maurice seems to have hesitated a little at this juncture; but some negociations which he established with the Protestants led to no result, and he went boldly over to the Emperor. During the long and active war which ensued, he distinguished himself greatly by his successes over his Protestant friends. In the following year (1547) the Elector was taken prisoner at the battle of Muhlberg. Maurice and the Elector of Brandenburg now interceded for the Landgrave with the Emperor, on whose authority they guaranteed the former his freedom, on condition that he surrendered and made an humble submission. But the Emperor, less mindful of his allies' honour than his own interest, detained the Landgrave in prison, notwithstanding the remonstrances repeatedly reiterated of Maurice and Brandenburg. The former had meantime received the Electorate of Saxony from the Emperor, and was solemnly invested therein in 1548.

In 1549 several charges having been made against him relative to his alleged attachment to popery, he refuted them in an able letter to his subjects. In 1550 Maurice opposed the Emperor through his representatives at the Diet at Augsburg, by protesting against the Council of Trent. In the same year he was appointed to the command of the imperial army which besieged Magdeburg, where he met with considerable success, although he seems to have been willing to favour the inhabitants as far as possible.

In 1551, on the Emperor summoning the States to the Council of Trent, Maurice caused the heads of his doctrines to be drawn up by Philip Melancthon; but he refused to send his divines unless a safe conduct was granted them, not only by the Emperor, but by the Council itself—instancing among others the case of John Huss, in which the authority of the former had been set at nought. Towards the end of the year, Maurice held a convention in his own states, to make peace with Magdeburg, which was eventually concluded.

In the meantime Maurice had not forgotten the Landgrave. After in vain sending to the Emperor praying for his restoration to liberty, he proposed to throw off a mask which had been long irksome to him. He accordingly entered into negociations with the King of Denmark and many of the German states, and also with the King of France. Denmark and most of the states sent ambassadors to the Emperor to mediate on behalf of the Landgrave, but ineffectually; and Maurice now prepared for open war. In 1552 he took the field with the Protestant princes, and on the whole with great success. The King of France had in the meantime made war upon the Emperor, who, pressed on all sides, was eventually compelled to succumb. The result was the signing (Aug. 12, 1552) of the celebrated treaty of Passau, which restored to the Protestants, with the free exercise of their religion, the rights of which they had been deprived since the victory of Muhlberg.

The last enterprise of Maurice was his war with Albert, Duke of Brandenburg, who had separated from the Confederates, and invaded Saxony. The Confederates inflicted a signal defeat upon the hostile force soon after they had crossed the Weser; but Maurice was killed in the engagement, July 9, 1553. He left behind him the reputation of a great captain, and a consummate politician.

MAURICE, THE REV. THOMAS, was born about 1755, at Hertford, where his father was head master of the Christ's Hospital school. At the age of 19 he was entered at St. John's College, Oxford, whence he removed to University College. After taking his degree of B.A., he was ordained by Bishop Lowth. He had already published a translation of the 'Œdipus Tyrannus,' and several other volumes of poems, but his turn for historical studies had been fostered at University College by his tutor W. Scott, afterwards Lord Stowell. His 'Indian Antiquities' began to be published in 1791, and the last volume appeared in 1797. Meantime he had undertaken his 'History of Hindostan,' the three volumes of which were published in 1795, 1798, 1799; and a second edition appeared in 1821. In 1798 he was appointed assistant-librarian in the British Museum. In 1800 Bishop Tomline obtained for him the pension that had been held by the poet Cowper. His 'Modern History of Hindostan,' in two volumes, appeared in 1802 and 1804. Several other volumes on Eastern history and theology, and attempts in verse, succeeded this work; and one of his last undertakings was his 'Memoirs.' Mr. Maurice died in his apartments at the British Museum, March 30, 1824.

MAURICIA'NUS, JU'NIUS, a Roman jurist, and a contemporary of Gaius. There are four excerpts from Mauricianus in the Digest.

MAURITA'NIA or MAURETA'NIA, which derived its name from its inhabitants Mauri or Maurusii, was bounded on the west by the Atlantic, on the north by the Mediterranean, on the south by the Gætúli, and on the east by Numidia, thus corresponding to the northern part of Marocco and the western part of Algiers. Mauritania was divided into two provinces by Claudius (A.D. 43), which were called respectively Mauritania Tingitana and Mauritania Cæsariensis. Tingitana, the western province, which derived its name from Tingis (*Tangier*), was divided from the other province Cæsariensis by the Molocath; and Cæsariensis was separated from Numidia by the Ampsagas (*Wadi-al-Kebir*).

Mauritania contained many towns of considerable importance under the Roman empire. The physical features, &c., of Mauritania are described in the articles ALGIERS and MAROCCO. The best account of the eastern part of Mauritania is in Shaw's 'Travels.'

MAURITIUS, the Island of, called also ISLE DE FRANCE, is situated in the Indian Ocean, between 19° 45′ and 20° 33′ S. lat., and between 56° and 57° E. long. Its length is about 36 miles, breadth 20, and area 700 square miles.

The island is surrounded by a coral reef, generally running parallel to the shores, at the distance of one or two furlongs, and mostly dry at low water. In this reef occur eleven breaks, by the greater number of which vessels of considerable burden may approach the island. The water between the reef and the shores, being less agitated than the open sea, affords facilities of communication between the places along the coast. The interior of the island consists of a great number of lofty hills, of which the Brabant mountains attain a height of 3000 feet, and Peter Botte mountain presents an extraordinary shape. In the mountains at the back of Port Souillac and Grand Port is a small lake, which is considered to be an extinct crater. The ground is generally covered with loose rocks, and the soil is rather sterile. The rains and hurricanes are very violent.

This island was formerly covered with woods, and even now a considerable part of the native forest is allowed to remain for ornament round the plantations. Many tropical and a few European plants are cultivated. The culture of the sugar-cane has spread rapidly since the English obtained possession of the island. The quantity of sugar it supplied to England was, in 1828, 40,320,000 lbs.; in 1847, 133,679,952 lbs.; but in 1848 the entire crop of the island yielded only 99,234,352 lbs. This diminution is no doubt in some measure, if not entirely, owing to the fact that a fatal disease has lately made its appearance among the cane plants of the island; and to such an extent that, in 1848, 10,000 plants of a different species of cane were introduced from Ceylon, but it is said with little success, as the insect (a species of coccus) which preyed upon the old plants seeks its food on all plants of the same genus as the sugar-cane. In consequence of this disaster, and perhaps also of the effect of the act of 1846 on the sugar trade of the island, much attention is now given to extend the cultivation of the mulberry for the production of silk, which cultivation had been previously introduced with great success in those parts of the island that were least adapted for the growth of the sugar cane. Coffee and pepper are also cultivated to some extent.

Horses are few, and seldom bred in the island. Mules and asses are more numerous, and principally used for the saddle. Cattle are scarce, but goats, sheep, hogs, and fish abound.

The population amounts to about 100,000, of whom about 10,000 are whites, 20,000 liberated Africans, and 70,000 Hill Coolies.

Port Louis, the capital and only town of the island, is situated near the north-western extremity, on a small bay called Port North-West or Port Louis, which can accommodate a numerous fleet of ships. The streets of the town are straight but not paved. The houses are all built of wood, with only one floor. The town contains about 27,000 inhabitants. There is a library containing more than 60,000 volumes, mostly French books; a good botanical garden; and some docks for the repair of vessels. There is another port in the island called Port Grand. The trade of the island is carried on not only with England, but with the countries around the Indian Ocean. There is packet communication monthly between Mauritius and Ceylon.

Mauritius was discovered by the Portuguese in 1505. The Dutch surveyed it in 1598, and made a settlement in 1640, but they abandoned the island in 1708. In 1715 the French took possession of the island, formed a settlement at Port North-West, and called the island Isle de France. They remained in the undisturbed possession of it to the year 1810, when it was taken from them by the British, who since the peace of 1814 have retained it in their possession.

MAURO'LICO, or MARULLO FRANCIS, abbot of Messina, was born at that place, September 16, 1494, and died there, July 21, 157. Maurolico taught mathematics publicly at Messina and lived in habits of close friendship with Cardinal Bembo. These, and his being obliged much against his will, to suppress a part of his dissertation on comets, on account of the offence which some passages gave to certain Venetian noblemen, are the only circumstances of his personal life which are worth recording.

The printed works of Maurolico are numerous and those which he wrote still more so. Among the former must be mentioned an edition of Autolycus with commentaries, Messina, 1558, folio of Archimedes, 1670 and 1681; the 'Phenomena' of Euclid, 1588, and an edition of 'Theodosius and Menelaus' in the same year, which contains a table of secants; 'Opuscula,' printed at Venice, 1575, containing treatises on the sphere, the calendar, astronomical instruments, gnomonic, music, and arithmetic; treatise on Cosmography, 1543. Other works have been stated as printed, but we have only inserted those which have good authority.

MAURUS TERENTIA'NUS, a Latin grammarian, who is said to have been born at Carthage. He is the author of a work entitled 'De Litteris, Syllabis, Pedibus, et Metris, Carmen.' It is included in the 'Grammatici Veteres,' edited by Putschius, Hanover, 1605; and has been also edited by Lachmann, Leipzig, 1836.

MAURY, JEAN SIFFREIN, was born on the 26th June, 1746, at Vauréas, in the Venaissin, of poor parents. He was bred to the church, and went to Paris at the age of 18, where he soon attracted the notice of learned men. In 1772 his 'Eloge' on Fénélon procured for him the vicar-generalship of the bishop of Louberg. He increased his reputation by his panegyrics of St. Louis and St. Augustine, and was successsively appointed to the Abbey of Frenade and preacher to the court. At the Assembly of the States General in 1789 he was named deputy of the clergy for the bailiwick of Péronne, and distinguished himself by his firm advocacy of the royal cause, and his courageous refusal to take the oath of allegiance to the constitution in 1790. Obliged to leave Paris, he was received warmly by the Pope, and named successively Archbishop of Nicæa, apostolical nuncio to the diet held for the election of the Emperor Francis II., and in 1794 Cardinal. On the reconciliation of the First Consul with the church of Rome, he wrote to Napoleon in submissive language, begging to be received back into the French dominions. An interview between him and Napoleon took place at Genoa in 1806, and Maury, to the disgust of those who admired him as the courageous defender of royalty, reappeared at Paris, was loaded with distinctions, and appointed in 1810 Archbishop of Paris, which disgraced him with the Pope. On the return of the Bourbons he was deprived of his diocese, and fled to Rome, where he suffered imprisonment, and lived and died in retirement there on a pension given to him in compensation for his resignation of the cardinal's hat. His death took place on the 11th of May, 1817. His principal work, which ranks high in France, is his 'Essais sur l'Eloquence de la Chaire.'

MAUSOLE'UM is used as a term applied to a sepulchral chapel or edifice erected for the reception of a monument; but it originally designated the magnificent structure raised by Artemisia as the tomb of her husband Mausólus, king of Caria, at Halicarnassus, B.C. 352. Of this monument no remains now exist; but from Pliny's description it appears to have been nearly square in its plan, measuring 113 feet on its sides, and 93 on each of its ends or fronts, and to have been decorated with a peristyle of thirty-six columns (supposed by Hardouin to have been 60 feet high, or upwards), above which the structure was carried up in a pyramidal form, and surmounted at its apex by a marble quadriga executed by Pythis, who, according to Vitruvius, was joint architect with Sátyrus in the building. It was further decorated with sculptures and reliefs by Scopas, Bryaxis, Timotheus, and Leóchares. The entire height was 140 feet.

The mausoleum erected at Babylon by Alexander the Great, in honour of Hephæstion, appears to have been still more magnificent. Those of Augustus, in the Campus Martius, and Hadrian at Rome, were structures of great magnitude and grandeur, and resembled each other in being circular in plan. Hadrian's is now converted into the Castello di St. Angelo, in which shape it is familiar to almost every one.

Such places as Henry VII.'s Chapel and the Pantheon of the Escurial may also be considered as mausoleums; but the term is generally restricted to a detached edifice erected merely as a private burying-place or to contain tombs.

MAWES, ST. [CORNWALL.]

MAXE'NTIUS, MARCUS AURELIUS VALERIUS, son of Maximianus, the colleague of Diocletian in the empire, was living in obscurity when, after his father's abdication, and the elevation of Constantine to the rank of Cæsar, he became envious of the latter, and dissatisfied with the neglect of Galerius towards him. Accordingly he stirred up a revolt among the prætorian soldiers at Rome, and was proclaimed emperor, A.D. 306. He retained the imperial title and possession of Italy till A.D. 312, when he was defeated by Constantine, and was drowned in attempting to cross the Tiber. [CONSTANTINUS.]

MA'XIMA AND MI'NIMA. These Latin words, which simply mean 'greatest' and 'least,' are used to imply, not the absolute greatest and least values of a varying quantity, but the values which it has at the moment when it ceases to increase and begins to decrease, or vice versâ. Thus if it be said that the height of the barometer was a maximum at ten o'clock, it means that up to that hour the barometer rose, and then began to fall; in which case it would still be said to have been a maximum, even though it should afterwards rise, and stand at a greater height than at ten o'clock. Thus it is possible that there should be several maxima and minima in one day, and even that one of the minima should be greater than one of the maxima: that is, at one moment when the fall ceases and a rise begins, the barometer may then be higher than it was at another time when a rise had ceased and a fall begun.

MAXIMIA'NUS, MARCUS VALERIUS, a native of Pannonia, born of obscure parents, served in the Roman armies with distinction, and was named by Diocletian his colleague in the empire, A.D. 286. The remainder of his life is given under DIOCLETIAN, CONSTANTIUS I., and CONSTANTINUS. He was put to death at Marseille, by order of Constantine, for having conspired against his life, A.D. 310.

MAXIMILIAN. [HABSBURG, HOUSE OF.]

MAXIMI'NUS, CAIUS JULIUS VERUS, was originally a Thracian shepherd. He was of gigantic size and great bodily strength. Alexander Severus gave him the command of a new legion raised in Pannonia, at the head of which he followed Alexander in his campaign against the Germans on the banks of the Rhine, where he induced some of his companions to murder Alexander in his tent, as well as his mother Mammæa, A.D. 235.

Maximinus, being proclaimed emperor, named

his son, also called Maximinus, Cæsar and his colleague in the empire. But his cruelty and rapacity aroused enemies against him in various parts of the empire. The province of Africa revolted, and proclaimed Gordianus, who was soon after acknowledged by the senate and the people of Rome, A.D. 237. On the news of the defeat of Gordianus and his son by the Roman governor of Mauritonia, the senate proclaimed emperors Clodius Pupienus Maximus and Decimus Cælius Balbinus, and Maximinus was shortly afterwards killed A.D. 238, by his own soldiers, while he was besieging Aquileia.

MAXIMI'NUS, DAIA, or DAZA, an Illyrian peasant, served in the Roman armies, and was raised by Galerius, who was his relative, to the rank of military tribune, and lastly to the dignity of Cæsar, A.D. 302, at the time of the abdication of Diocletian and Maximianus, when he had for his share the government of Syria and Egypt. After the death of Galerius, A.D. 311, Maximinus and Licinius divided his dominions between them, and Maximinus obtained the whole of the Asiatic provinces. Valeria, the daughter of Diocletian and widow of Galerius, having escaped from Licinius into the dominions of Maximinus, the latter offered to marry her, and on her refusal banished her with her mother into the deserts of Syria. He persecuted the Christians and made war against the Armenians. A new war having broken out between Licinius and Maximinus, the latter advanced as far as Adrianople, but was defeated, fled into Asia, and died of poison at Tarsus, A.D. 313.

MAXIMUS, C. P. [BALBINUS.]

MAXIMUS PLANUDES. [PLANUDES.]

MAXIMUS. [GRATIANUS; THEODOSIUS.]

MA'XIMUS, RUTILIUS, a Roman jurist, who probably wrote under Severus and Caracalla. There is one excerpt from Maximus in the Digest.

MA'XIMUS TY'RIUS, a rhetorician and Platonic philosopher, lived in the latter half of the second century, during the reigns of the Antonines and of Commodus.

There are extant forty-one dissertations of Maximus Tyrius on various points connected with the Platonic philosophy, which are written in an easy and pleasing style, and more commendable for the expression than the matter. The following examples will give some idea of the subject of these dissertations:—'On Plato's Opinion respecting the Deity;' 'Whether we ought to return Injuries done to us;' 'Whether Prayers should be addressed to the Deity,' &c.

The dissertations have been translated into French by Forney, 1764, and by Dounais, 1802; into Italian by Petro de Bardi, Venice, 1642; and into German by C. T. Damm, Berlin, 1764.

MAXWELL, ROBERT, LORD, son of John, third Lord Maxwell, who was killed at Flodden, in September, 1514. In 1536 he was appointed one of the lords of the regency during the absence of King James V. on his matrimonial expedition to France. He is said to have advised the expedition which terminated at Solway Moss, but was so incensed at the command of the army being given to Oliver Sinclair, that he mutinied, and yielded himself up a prisoner to the English. On the death of King James V. he was ransomed, in the hope that he would further the projects of King Henry VIII. in reference to the marriage of the Queen of Scots. In the first parliament of Mary, March, 1543, he presented a writing or a Bill, for an act of Parliament to allow the reading of the scriptures in the vulgar tongue, which was adopted. He died July 9, 1546.

MAXWELLTOWN. [KIRKCUDBRIGHT.]

MAY, the fifth month of our present year, was the second in the Old Alban calendar, the third in that of Romulus, and the fifth in the calendar of Numa Pompilius. In the Alban calendar it consisted of twenty-two days; of thirty-one in the calendar of Romulus; and of thirty in that of Numa. Julius Cæsar restored to it the odd day of which Numa had deprived it, and of which it still keeps possession. Its etymology is doubtful.

MAY-FLY, the popular name of the *Neuropterous* insects of the genus *Ephemera* and its allies. [EPHEMERA.]

MAY-WEED (*Anthemis arvensis*, or Wild Chamomile), a troublesome weed in corn, which is difficult to eradicate, as it is propagated both by seed and by the low running branches which strike into the soil and take root. It flowers in May, as its name denotes, and sheds its seed long before the corn is reaped. The only certain mode of extirpating it is by great care in clearing the land when it is fallowed or prepared for turnips, ploughing it in as soon as the flowers appear, and never allowing it to go to seed.

MAY, THOMAS, was born in 1595. In 163[illegible] May was defeated by Sir William Davenant as candidate for the office of laureate, which the death of Ben Jonson had left vacant, which so exasperated May that he became a strong parliamentarian, wrote a history in favour of that party, and held office under it. In 1650 he was found dead in his bed. He was buried in Westminster Abbey, but, on the Restoration, his body was removed to a large pit in the church-yard of St. Margaret's, Westminster, and his monument pulled down. His principal works are:—'The History of the Parliament of England,' which begun Nov. 3, Lond. 1647; 'The Reign of King Henry II.,' a poem, with a survey of the times and character of the king and his son, in prose; a translation of Lucan's 'Pharsalia,' with a continuation in Latin and English; and five plays, of which two are given in Dodsley's 'Old Plays.'

MAYBOLE. [AYRSHIRE.]

MAYENCE. [MAINZ.]

MAYENNE, a department in France, formed out of Lower Maine and a small portion of Anjou, is bounded N. by the departments of Manche and Orne, E. by the department of Sarthe, S. by Maine-et-Loire, and W. by Ille-et-Vilaine. It approaches in shape to a rectangle, 54 miles long by 40 wide. The area is 1988 square miles, and the population is 368,439, which gives 185.33 to the square mile, being 11.58 above the average per square mile for all France.

The surface of the department is uneven, strewed with hills, and in some places cut up by valleys and ravines. The Armoric hills run across

the department in the north, and send out a branch southwards, which forms the watershed between the Vilaine and the Mayenne. From a distance the country has the appearance of a vast forest, such is the number of trees planted in the hedge-rows that inclose each field. The population of Lower Maine does not, as is the case in most parts of France, live in hamlets or villages, but is scattered among isolated farmhouses, each of which stands among thick hedges, and contains a family that is supplied with every necessary of life, both of food and clothing, from the land and their own industry. This isolated and independent existence has left its impress on the people in a certain rudeness of address, an honest but obstinate adherence to old usages, and a consequent aversion to things called improvements. The soil in the arrondissement of Château-Gontier, and in part of that of Laval, is productive in bread-stuffs of all kinds; in the rest of the department the land is poor, and does not yield enough for the consumption of the inhabitants. Meadow land is scanty, nevertheless a great number of beasts are fed, which form a source of considerable profit to the farmer. Flax, hemp, and fruit trees are extensively cultivated. Other products are chestnuts, nuts, some bad wine, and cider fruits yielding 6,833,288 gallons of cider. Well-woolled sheep, pigs, and fowls are numerous. Bees are kept in great numbers.

The department belongs almost entirely to the basin of the Loire, and is drained chiefly by the *Mayenne* (the ancient *Meduana*), which rises in the south of the department of Orne, and running nearly south past the towns of Mayenne, Laval, and Château-Gontier, divides the department of Mayenne into two pretty equal parts. A few miles below Château-Gontier, it enters Maine-et-Loire, where it receives the Oudon on the right bank, and the Sarthe, swelled by the Loir, on the left; from its junction with the Sarthe to its entrance into the Loire at Ponts-de-Cé, about 5 miles S. of Angers, this river takes the name of Maine. Small steamers ply up to Angers, and barges up to Laval. The principal feeders of the Mayenne in this department are the Varenne, the Calmont, and the Ernée, on the right bank, and the Jouanne, and the Ouette, on the left bank. A small portion of the west of the department is included in the basin of the Vilaine. [ILLE-ET-VILAINE.] A narrow band along the east of the department is drained by feeders of the Sarthe. The south-western districts are drained by the Oudon.

The department is crossed by 5 royal, 11 departmental, and a great number of bad cross roads. It is also traversed by the railway now in course of construction from Paris to Brest, which passes through Laval.

Iron mines are worked for the supply of 8 smelting furnaces and 10 forges. Coal mines are worked near Laval. Marble, granite, flint, building and lime-stone, and slate, are quarried. White sand, used in the manufacture of glass, is raised. Sailcloth and linen are the chief manufactures; cotton stuffs, haircloth, linen thread, and paper are made. About 215 fairs are held in the year.

The climate is healthy, and resembles that of the south of England.

The department contains 1,272,312 acres, distributed among 74,916 proprietors, and into 898,823 parcels. Of this surface, 875,521 acres are arable; 171,344 are grass land; 65,186 are covered with woods and forests; 27,351 are laid out in nurseries, plantations, gardens, &c.; 50,367 acres consist of heaths and moors; and 9951 acres are covered with rivers, ponds, brooks, &c.

The department is divided into 3 arrondissements, which with their subdivisions and population are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Laval . . .	9	93	127,719
Mayenne . .	12	116	163,081
Château-Gontier . . .	6	72	77,639
Total . .	27	281	368,439

In the arrondissement of Laval, the chief town is LAVAL, which is also the capital of the department. *Argentré*, 6 miles E. from Laval, stands on the slope of a hill near the Jouanne, and has marble quarries, tanyards, and about 2000 inhabitants. *Chailland*, 12 miles from Laval, has coal-mines, iron-forges, smelting-furnaces, and a population of 2600. *E'vron* stands in a remote but fertile district, E. by N. of Laval, and has a population of 4130. The ancient chapel of St.-Crespil and the market-house are the most notable buildings. This town has a good weekly corn market, linen manufactures, and some trade in wine, wool, and brandy.

In the arrondissement of Mayenne, the chief town, *Mayenne*, stands on the steep slopes of two hills, united by a bridge across the river Mayenne, 18 miles N. by E. from Laval, and has tribunals of first instance and of commerce, a college, a council of Prud'Hommes, and 9225 inhabitants. The streets are ill laid out, irregularly built, with old odd-looking houses, and so steep, that it is not unusual to see 8 horses and 4 bullocks yoked together drawing a single carriage. On the top of the hill on the right bank there are two large squares, in one of which is the town-house. The old castle of the lords of Mayenne stands on the right bank of the river and commands the bridge; a large building near it serves for the linen-market. Linen, calicos, and cotton yarn are the chief industrial products of the town, which has also bleach-mills and dyehouses. *Ambrières*, 6 miles N. from Mayenne, is a well built town of 2453 inhabitants. A castle now in ruins, built here by the Conqueror, is the most interesting object in the town. *Bais*, a town of 2342 inhabitants, S.E. of Mayenne, was burned by the Vendeans in 1799. *Ernée*, prettily situated on the river Ernée, 14 miles W. from Mayenne, is a well built town, with wide straight streets and 5489 inhabitants, who manufacture linen yarn and cloth. There are iron mines and iron forges near Ernée. *Gorron*, 12 miles N.W. from Mayenne, has a population of 2351. The ancient

castle of Gorron, one of the frontier fortresses of Maine, has been entirely destroyed, and a corn-market erected on its site. *Lassay*, 12 miles N.E. from Mayenne, has 2565 inhabitants and an ancient castle, the erection of which dates from the year 825, and which is the best preserved of the old fortresses of Maine. *Prez-en-Pail*, 20 miles N.E. from Mayenne, on the road to Alençon, has a population of 3495. *Villaines-la-Juhel*, E. of Mayenne, has 2500 inhabitants, who manufacture woollen cloth.

In the arrondissement of Château-Gontier, the chief town, *Château-Gontier*, is situated in a beautiful plain, 16 miles S. from Laval, on the left bank of the Mayenne, over which a stone bridge leads to a large suburb. Of the castle built here by Foulques Nera, count of Anjou, who intrusted its safe keeping to a knight named Gontier (whence the name), there is scarcely a vestige. The town, which is ill laid out, but has well-built houses, possesses a tribunal of first instance, a college, and 6485 inhabitants, who manufacture linen, serge, haircloth, and leather, and trade in clover seed, thread, iron, timber, and wine. The most notable objects in the town are the square on the site of the old castle, and the promenade which commands a fine view of the picturesque banks of the Mayenne. *Cosse-le-Vivien*, N.W. of Château-Gontier, has 3408 inhabitants. *Craon*, formerly a fortified town, and famous for its siege by the Prince of Conti in 1592, is situated on the left bank of the Oudon, 12 miles W. from Château-Gontier, and has 3900 inhabitants, who manufacture coarse woollens, and trade in corn, linen, thread, &c.

The department forms with that of Sarthe, the see of the Bishop of Le-Mans; it is included in the jurisdiction of the Cour Royale and University-Academy of Angers; and belongs to the 4th Military Division, of which Tours is head-quarters. Under the monarchy it returned 5 members to the Chamber of Deputies; it now has 8 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1849; *Statistique de la France.*)

MAYER, TOBIAS, was born at Marbach, a town of Würtemberg, on the 17th of February, 1723. He was left an orphan and unprovided for at a very early age. To gain a livelihood he began teaching the mathematics, and at the age of twenty he studied the principles of gunnery, probably with a view of entering the army. He published a memoir in 1750, 'On the Libration of the Moon.' In 1751 he became director of the observatory at Göttingen, and at the same time or subsequently was appointed professor of economy in that university. At Göttingen, during the remainder of a very short life, he laboured with the most praiseworthy zeal to promote the sciences of geography, navigation, and astronomy. His 'Zodiacal Catalogue' was 'deserving of all confidence' (Delambre), and comprised 998 stars, including those whose correct positions are of most importance to the astronomer. In 1755 he published his 'Lunar Tables' in the 'Acts of the Academy of Göttingen,' and a copy of them was forwarded to the London Board of Longitude. By order of the Board the accuracy of the tables was rigorously tested by Dr. Bradley, who was able in no instance to detect an errors greater than 1′ 30″ (the errors of the other tables then existing sometimes amounted to 10′), and even part of this he was of opinion might be fairly attributed to his own observations. These tables were printed by the Board of Longitude in the year 1767, and likewise the 'Solar Tables' by the same author, in the year 1770. After the death of Mayer the British parliament, at the recommendation of the Board, paid his widow the sum of 3000*l.* The original resolution of the Board, dated 9th of February, 1765, recommends that a sum 'not exceeding 5000*l.*' should be awarded; and Delambre states that a further sum of 2000*l.* was subsequently paid; but this is a mistake. To Mayer is also due the discovery of the principle of the repeating circle, which was afterwards so fully developed by Borda, and employed by him in the measurement of the arc of the meridian. Mayer died at Göttingen on the 20th of February, 176[illegible].

MAYER, SIMONE, was born in Bavaria about 1760, and at an early age sent to study music in Italy, in which country he passed the greater portion of his life, and drew his last breath. In 1802 he was chosen as Maestro di Capella to the church of Maria Maggiore in Bergamo. In 1799 appeared his first distinguished opera, now known under the title of 'Il Fanatismo per la Musica.' In 1802 he produced his 'Misteri Eleusini;' and following on this came his 'L'Equivoco,' 'La Ginevra di Scozia,' 'Lodoiska,' 'Aleramo ed Adelasia,' 'La Rosa Bianca e la Rosa Rossa,' and the most celebrated of all, 'Medea,' in which Madame Pasta made so great an impression throughout Europe. Mayer died in 184[illegible].

MAYNE, JASPER, was born in 1604, in Devonshire. After being at Westminster school, he was entered as a servitor of Christchurch, Oxford, and in 1631 he commenced M.A. Taking holy orders, he became a popular preacher. He was created D.D. in 1646. Firmly devoted to the royal cause, he was deprived of his student's place in 1648, and two livings which he then held. He resided, till the Restoration, as chaplain in the family of the Earl of Devonshire. In 1660 he was restored to his livings; became chaplain in ordinary to the king, a canon of Christchurch, and archdeacon of Chichester. He died at Oxford in 1672. He is remembered only through his plays: 'The City Match,' a Comedy, given in Dodsley's 'Old Plays;' and 'The Amorous War,' a tragi-comedy.

MAYNOOTH. [Kildare.]

MAYO, a maritime county of the province of Connaught, in Ireland, is bounded E. by Sligo and Roscommon, S. by Galway, and W. and N. by the Atlantic Ocean. It lies between 53° 40′ and 54° 19′ N. lat., and between 8° 31′ and 10° 20′ W. long. Its greatest length, E. to W., is [illegible] miles; its greatest breadth, N. to S. is 58 miles. The area is 2131 square miles, or 1,363,882 acres. The population in 1841 was 388,887.

Mayo has a very diversified surface, embracing a part of the great inland plain which extends across the centre of the island, together with

large extent of wild and mountainous country interposed between the western verge of that plain and the sea. The mountain region consists of two principal districts, separated from one another by Clew Bay, a capacious inlet of the Atlantic, which, running inland to a distance of fifteen miles, by from seven to eight miles in width, meets the western extremity of the plain at Westport. The mountain groups lying south of Clew Bay cover the entire barony of Murrisk, and stretch beyond the bounds of the county into the highlands of Joyce's Country and Connemara. On both sides of the chain are bold ravines, traversed by streams descending on the one hand into Lough Mask, and on the other into the valley of the Owen Errive river, which runs southward into the head of Killery Harbour, and also into the valley of the Ayle. One of the sources of the Owen Errive is the Lake of Glenawagh, which lies in what is locally termed a *prison*, being a bowl-shaped hollow in the northern side of Furmnamore, surrounded by perpendicular precipices 1500 feet high. West of the valley of the Owen Errive lies the group of Muilrea. The northern verge of Murrisk, bordering on Clew Bay, is occupied through a length of ten miles by the range of Croagh Patrick, running parallel to the shore. The Croagh Moyle mountains, the Nephin mountains, and the Tyrawley mountains, present many summits from 1600 to 2600 feet high. Between and among them are Lough Conn, the valley of the Moy, Lough Fyough, Lough Beltra, Lough Lavalla, the Deel river, and the Owenmore river. A bold mountain range occupies the entire promontory of Corraun Achil, and beyond it, rising again into very bold eminences throughout the large island of Achil, which is separated from the mainland by a very narrow sound running up between Clew Bay and Blacksod Harbour. The surface of Achil Island is extremely mountainous, and its shores are perhaps more precipitous than any equal extent of coast in the British islands; it is in one part 2220 feet high. The island is of a triangular shape, measuring 15, 14, and 12 miles on its three sides. South from Achil Island is Clare Island, in the middle of the entrance of Clew Bay, and 17 miles W. from Westport; it is 4 miles long by 1½ wide. North from Achil Island is the peninsula of the Mullet, extending fifteen miles in length, and connected with the mainland of Erris by an isthmus five miles long by one mile on an average in breadth, which separates the head of Blacksod Bay from the head of the Bay of Broadhaven, included between the Mullet and the mainland in a similar manner on the north. On the western side of the Tyrawley and Nephin Beg chain are numerous lakes, of which the greatest is Lough Carrowmore, five miles in length, which discharges its waters by the Owenmore river into Tullaghan Bay, an arm of Blacksod Harbour. On the eastern side of the Nephin range is Lough Conn, a fine sheet of water, 8 miles in length by from one to 4 miles in width, communicating on the south by a narrow strait with Lough Cullin, a smaller lake, through which it discharges its waters into the river Moy close to Foxford.

The remainder of the county, consisting almost wholly of open undulating plains, is divided by a low range of eminences running south of Castlebar into two principal districts, the waters of one of which run northward by the Moy to the sea at Killala, and those of the other southward to Loughs Mask and Corrib, and so to the sea at Galway. The district immediately surrounding Westport, the waters of which extend westward to Clew Bay, is comparatively of inconsiderable extent.

From Westport to Newport the head of Clew Bay is studded over with green pasturable islands, varying in size from a few acres to half a mile in length, and in number amounting to 170. The shore along the head of the bay is also good arable and pasture land, and is worn into numerous peninsulas and low promontories, many of them wooded.

The only harbour generally frequented on the northern coast is that of Killala, formed by the embouchure of the river Moy. The bay is a square of about five miles each way, with a range of sand-hills extending across the bottom. In this range there are two openings, one forming the bar of the Moy, and the other that of Killala harbour. From Killala Bay westward the coast for a distance of twenty miles rises in lofty cliffs, affording very little shelter for craft of any kind. This iron-bound coast continues to Benwee Head, between which and the north-eastern extremity of the Mullet is the entrance to the fine but little-used harbour of Broadhaven. The western shore of the Mullet has little shelter for vessels of burthen. The shores of the great bay of Blacksod Harbour afford numerous excellent roadsteads and several sheltered spots well adapted for landing cargoes. The remainder of the rugged coast affords few good anchorages, except among the islands of Clew Bay.

The only navigable river in the county is the Moy. There are no canals. Many good roads have been constructed during the present century. There are no railways in the county.

Geology, Soil, and Productions.—The geological structure of Mayo resembles, in its general features, that of Galway, exhibiting an arrangement of primary and secondary rocks skirting a limestone basin. As usual, the cultivated district and the field of limestone are co-extensive, the primary and secondary formations being confined to Erris and western Tyrawley on the north, and to Murrisk on the south. The eskers which occur throughout the limestone plain near Westport exhibit traces of a current setting towards Clew Bay. Indications of coal are said to have been observed in Slieve Carnon, and deposits of manganese occur near Westport, but at present there are no mining operations carried on in this county beyond the quarrying of slates. Marble susceptible of a good polish has been quarried in several parts of the barony of Murrisk.

The soils of the cultivated tract are in general similar to those of other limestone districts: the best lie about Balla, Claremorris, and Hollymount on the south, and round Ballina on the north. Generally speaking, cultivation occurs only in

detached patches. In 1847, out of the 1,363,882 acres which Mayo contains, there were only 122,567 under crops.

The coast fishery, which might be rendered very productive, gives employment to about 4000 fishermen. Turbot, sole, cod, ling, hake, haddock, plaice, oysters, lobsters, and herrings, are caught.

The manufacture of linens is carried on to a considerable extent by the country people: the cloth is generally sold in the rough state by the small manufacturers, and bleached in other counties. There is also throughout the county the usual home manufacture of friezes and coarse woollens.

Divisions and Towns.—Mayo is divided into 9 baronies. It is in the diocese of Tuam, Killala, and Achonry. It is in the Connaught circuit, and the assizes are held at Castlebar. The county returns 2 members to parliament.

The following are the principal towns, with the population of each in 1841:—

Ballina, properly so named, is situated on the west bank of the Moy, a short distance from its entrance into Killala Bay, but Ardnaree, on the east bank of the river, and in the county of Sligo, is generally considered as a part of Ballina. The population of Ballina is 5313; of Ardnaree, 1699; total, 7012. The town has been much improved of late years, and contains a fine old church, a large Roman Catholic chapel, a Baptist chapel, a Methodist chapel, sessions-house, and union workhouse.

Ballinrobe is watered by the Robe, a stream which falls into Lough Mask, two miles W. from the town. It contains a sessions-house, union workhouse, church, and Roman Catholic chapel. Population, 2678.

Castlebar, the county town, is situated near the bottom or north-eastern end of the Castlebar Lake, and is watered by the Castlebar River, which flows N.E. and N. to Lough Cullin and Lough Conn. The streets are tolerably regular, and in the square are the county courts, public offices, and a promenade. The town contains also a new church, spacious Roman Catholic chapel, and county-gaol. Castlebar has a good retail trade, and much agricultural produce and a considerable quantity of coarse linens are disposed of at the weekly markets. Population, 5137.

Clare is a small town well situated for retail trade, about 30 miles S. by E. from Ballina, and 13 N.W. from Ballinrobe. Population, 2256.

Crossmolina is a small market-town, about a mile from the north-western shore of Lough Conn, watered by the river Deel, which falls into Lough Conn. It consists principally of low slated houses, forming two streets. Population, 1672.

Killala is a small town, situated on the west side of the æstuary of the Moy, at the head of Killala Bay. The town was formerly the see of a separate bishopric, which is now united with Tuam and Achonry, and contains an ancient but small cathedral, a Roman Catholic chapel, and Methodist meeting-house. Population, 1446.

Westport is a modern town, with regular streets, situated in a narrow valley between mountains, at the head of Clew Bay, and watered by a pretty mountain stream, which runs through the centre of the town. The port is separated from the town by the intervening demesne of Lord Sligo. Corn and provisions are shipped from the port to a considerable amount. The town contains a commodious Roman Catholic chapel, and there is a parish church situated on the demesne of Lord Sligo. Population, 4365.

History and Antiquities.—This county formed part of the grant made by King Henry II. to William Fitz-Adelm de Burgho about the year 1180, O'Connor being at that time the native King of Connaught, which included Mayo. There is very little known of the subsequent proceedings of the settlers until the period of the great rebellion succeeding the assassination of William de Burgho, earl of Ulster, in A.D. 1333. About this time Mayo was a county. It fell away however from all subjection to the English law immediately after the murder of the earl, and remained so for more than two centuries. The first step towards a return to English law and manners was made in 1575, when the chiefs made their submission to Queen Elizabeth; but it was not till 1586 that the English supremacy was fully acknowledged. The old families of Mayo, in general, took part in the rebellion of 1641 and the succeeding wars, and very extensive forfeitures were the consequence. The chief political event since that time was the invasion, by the French, under General Humbert, in 1798. The invading force consisted of 1100 rank and file only; but such was the alarm caused by their unexpected descent, that they easily carried the towns of Killala and Ballina; and, being joined by a large body of the peasantry, defeated General Lake, at the head of 6000 men, before the town of Castlebar. The surrender of the invading force at Ballinamuck however soon restored tranquillity.

The antiquities of the county are chiefly ecclesiastical. There are round towers at Killala, Turlogh, Meelick, and Balla. At Cong are the remains of a splendid abbey, originally founded in the seventh century, and re-edified by O'Connor in the twelfth. At Ballyhaunis are the ruins of a largely endowed abbey founded by the family of Nangle. Very fine remains of a Franciscan friary at Moyne, founded by William de Burgho, are still standing. Rosserk abbey, in the same neighbourhood, built by the Joyces in the fifteenth century, is another very striking ruin. The remains of Ballintubber abbey, seven miles from Ballinrobe, are among the most elegant specimens of early architecture in Ireland. Numerous other remains of religious houses founded by the families of De Burgh, O'Malley, and Nangle, throughout the county, are enumerated.

The military antiquities are not in general of much extent or interest. Carrig-a-Nile, Doona Castle, Inver Castle, and Doonbriste Castle, are the principal.

MAYOR. [Municipal Corporations.]

MAZANDERAN. [Persia.]

MAZARIN, CARDINAL. [Anne of Austria; Louis XIV.]

MAZEPPA, Hetman (that is, commander-in-chief) of the Cossacks of the Ukraine, has become

celebrated by a poem of Lord Byron, which has for its subject his extraordinary adventure. He was the son of a Polish gentleman in Podolia. The popular story of his arrival among the Cossacks on the back of a wild horse to which he had been bound by the husband of a woman whom he had seduced, has been superseded by a prose version given in the contemporary memoirs of Passek, which state that he retired among the Cossacks overwhelmed with shame at his exposure in his native land. His military talent as displayed at the head of the Cossacks obtained for him the title of Hetman. His submission to the Czar of Muscovy, and his secret league with Charles XII. of Sweden, are matters of history. He died in Turkey, whither he had retreated after the battle of Pultava, about 1710.

MAZE'RES-EN-AOIX. [ARIE'GE.]

MAZOW, or MAZOVIA. [POLAND.]

MAZZOLI'NI, LODOVI'CO, a painter of Ferrara, sometimes called Lodovico Ferrarese, was born about 1481. His works are miniature altar-pieces, and are on the whole little inferior to the small works by Garofalo. He died at Ferrara in 1530.

The works of Mazzolini are not numerous. There are several in the Capitol and in the Doria Gallery at Rome; four in the Gallery of Berlin, among which is a valuable large picture on wood, of Christ disputing with the Doctors. There are also two very characteristic works of this master in the National Gallery, in London; and two in the Gallery of Bologna.

MAZZUOLI. [PARMIGIANO.]

MEACO. [JAPAN.]

MEAD, RICHARD, M.D., was born near London in 1675. He took the degree of M.D. at Padua in 1695. On his return to England he was appointed physician to St. Thomas's Hospital, London, in 1703, anatomical lecturer at Surgeons' Hall in 1711, and was afterwards elected a Fellow of the Royal College of Physicians. He was also physician to George II. His reputation was very great. He died in 1754. Dr. Mead published 'A Mechanical Account of Poisons,' London, 1702; 'A Short Discourse concerning Pestilential Contagion,' 1720; some papers on Grecian coins struck in honour of physicians; 'On the Scurvy,' 1749; 'On Small Pox and Measles,' 1748; 'Medicina Sacra, seu de Morbis Insignioribus qui in Bibliis memorantur,' 1748; 'Monita et Præcepta Medica,' 1751.

MEADOW SAFFRON. [COLCHICUM AUTUMNALE.]

MEADOWS are properly low grounds on the banks of rivers, which, being kept moist by their situation, and also occasionally flooded by the rise of the waters, are best adapted for the growth of grass, and are generally mown for hay. Some meadows of great extent, belonging to a community or district, in which every inhabitant has a right to send his cattle to graze, under certain regulations, are never mown.

When meadows are private property they become much more valuable. The flooding is encouraged or prevented according to circumstances, and in many cases artificial irrigation is adopted. If they are exposed to be too often inundated, they are protected by dams and sluices.

The herbage of low wet meadows is generally coarser and less nutritious than that of those which lie higher: hence upland hay, as it is called, is preferred for the better sort of cattle. Upland meadows are very valuable wherever there is a demand for good hay. Not being annually recruited by flooding, they would soon degenerate if some pains were not taken to keep up their natural fertility. This may be done in various ways: the most obvious is to recruit them frequently with the richest animal and vegetable manure, which, being spread over the surface at a time when showers are abundant, that is, either early in spring or immediately after midsummer, is washed down to the roots of the grass. A meadow, the soil of which is naturally of a rich nature, and adapted to produce fine grasses, may be mown year after year without any perceptible change in the quality of the hay; but meadows of inferior quality require to be occasionally cropped close, to check the growth of the coarser grasses, and to allow the finer to rise.

Of late years the practice of *soiling* has been extensively adopted; that is, all the grass is mown and carried every day in a green state, to cows or horses tied up in a stable. By this means all the advantage of mowing for hay is obtained, besides an abundant supply of rich manure, which can be applied to the land in a liquid and diluted state, when its effect is powerful and certain.

When a natural meadow has been neglected, and the grass is of an inferior quality, and mixed with rank weeds and moss, it requires much care to restore it to its original fertility. In most cases the shortest method and the best is to plough it up, clean and manure it during a course of tillage, and then to lay it down again in a clean and enriched state, by sowing the best sort of grass seeds.

It must be observed that it is not a matter of indifference what cattle are turned into the meadow after hay-making. Horses invariably produce coarse weeds by their dung and urine; cows may be depastured in autumn, as long as the surface is dry; but sheep are far more advantageous, and may be kept in the meadows at all times, if they are not too wet for the health of the sheep, and if there is no danger of their having the rot. As soon as the surface becomes soft by the autumnal rains, cattle should be excluded.

MEAN. By the mean of two or more quantities is meant an intermediate quantity determined by mathematical rules. There are more ways than one of finding a mean, but the two principal results of this kind are called the *arithmetical mean* and the *geometrical mean*. The names are not properly expressive of the distinction between them, but they are established by use.

An arithmetical mean is the simple *average*, formed by adding the quantities together, and dividing by the number of quantities. A geometrical mean is the square root of the product of the quantities.

The arithmetical mean, or average (which is always to be understood when the word mean is mentioned, unless the contrary be specified), is taken to be the most probable result of a number of discordant quantities, which would have been the same but for errors of observation or experiment.

In assuming the average as the most probable result, it is presumed that any one measurement is as likely to err one way as the other; that is, as likely to be too small as too great. If nothing but results be known, this presumption is justifiable; but if it be known that there is more tendency to error of one sort than the other, the most probable result cannot be ascertained until it is found out by how much the average of a very large number of observations would be affected by this tendency.

It is obvious that when observations nearly agree with each other, the average must be nearly the truth required, and the nearer the agreement of the observations, the more nearly. If the observations do not agree well, the average is still more likely than anything else, but not so likely as before.

MEASLES (*Morbilli, Rubeola*) is the popular name of a contagious disease, characterised by an eruption on the skin, and chiefly affecting children.

It is ushered in by more or less fever, a running from the nostrils and eyes, with some inflammation of the latter, sneezing, hoarseness, a dry cough, difficulty of respiration, and occasionally slight soreness of the throat. From three to six days after the commencement of these symptoms a rash begins to appear, which first shows itself in distinct red and nearly circular spots, having some resemblance to flea-bites: these spots gradually coalesce and form small slightly-elevated patches of an irregular figure, but approaching nearest to that of semicircles or crescents. At the commencement of the eruption the catarrhal symptoms and fever are somewhat augmented, and during its height the whole face is often swollen and the eyelids thereby closed; on its decline, which begins on the fourth or fifth day, the fever ceases, and from those parts of the body previously covered by eruption the cuticle separates in small bran-like scales. With respect to the treatment, little is required during the eruptive stage of the disorder, which is seldom attended with danger. It is chiefly necessary to open the bowels, to confine the patient to a light vegetable diet, with cold acidulated aqueous drinks, and to maintain a cool temperature in the room, which should be moderately darkened. It is frequently epidemic in this country, and although sometimes assuming a fatal type, it is more frequently mild.

MEASURE. One number or magnitude is said to measure another, when the first is contained an exact number of times in the second. [INCOMMENSURABLES; PROPORTION.]

MEASURES. [WEIGHTS AND MEASURES.]

MEATH, formerly distinguished as *East Meath*, a county in the province of Leinster, in Ireland, is bounded N. by Monaghan, N.E. by Louth, E. by the Irish Sea, S.E. by Dublin, S. by Kildare, S.W. by King's County, W. by West Meath, and N.W. by Cavan. Its form is very irregular. Its greatest length E. to W. is 47 miles; its greatest breadth N. to S. is 40 miles. The area is 906 square miles. The population in 1841 was 183,828.

Surface; Coast-line; Geological Character.—The loftiest elevations are in the western part of the county. The principal hill is Sliebhnalliagh. There are considerable elevations also in the north-east part of the county, on the north bank of the Boyne, about Slane and Newtown Fortescue. Various other parts of the county are hilly, but not so much as the districts just mentioned.

The coast has a tolerably straight outline running south by east from the mouth of the Boyne to the boundary of the county of Dublin near Gormanstown. The shore is low, skirted by sand-banks or hills, and broken by one or two small streams which flow into the sea.

The county of Meath is for the most part included in the great central carboniferous limestone district of Ireland; the whole of the southern part of the county, and considerable portions of the north and west, are occupied by this formation. The hilly parts belong to the transition district, which extends from the coast of the county of Down into the counties of Longford and Roscommon. A small tract, insulated in the midst of this transition district, is occupied by the rocks of the limestone formation, and by a small coalfield, the beds of which are however found to be not worth working.

The county belongs almost entirely to the basin of the Boyne; a small portion in the northern part of the county belongs to that of the Dee, the heights about Slane separating the two. The southern and south-eastern borders are watered by the affluents of the Liffey, or by some smaller streams which flow into the sea between the Liffey and the Boyne. The chief affluents of the Boyne are the Blackwater, Menagh, Blind, and Deel. The Boyne flows into the sea near Drogheda. The Nobbor is the chief affluent to the Dee. There are several small lakes. Lough Sheelin, which separates the counties of Meath and West Meath from that of Cavan, is of an oval form, 5 miles long, and about $2\frac{1}{2}$ miles broad. It contains a small islet, called Church Island, with the ruins of an old church on it. Lough Bawn, $1\frac{1}{2}$ mile long, but very narrow, and some smaller lakes, are on the western border of the county. The lake of Kilmainham, formed by an expansion of the river Nobbor, is about one mile long and above a quarter of a mile broad. Bogs are numerous, but the aggregate of their extent is small: the largest is on the border of the county south-west of Athboy.

About 14 miles of the Royal Canal pass through this county, giving access to Dublin and to the Shannon. Meath is tolerably well provided with roads. Portions of the Dublin and Drogheda Railway and of the Midland Great Western Railway traverse the county.

Agriculture and Productions.—This county has very few mountain-wastes, and the proportion of bog is small. The land is flat rich pasture land. The soil is for the most part a loam of the

richest character, and in many places of such depth that the turning up of a fresh portion of the soil by ploughing deeper than usual is considered as an efficient substitute for manuring. The farms are on the average larger than in most other parts of Ireland; the grazing farms average about 150 acres; and tillage farms 20 to 50. The mode of farming, though very slovenly and defective, bears some resemblance to that of England. The whole quantity of land devoted to green crops is small, in consequence of the abundance of the natural pastures, which are of unequalled richness, and have led the farmers to give their chief attention to grazing.

The quantity of cattle fattened in the pastures of the county is considerable, and the breeds fattened are numerous. The grazing is carried on on a large scale. Many persons fatten from 300 to 500 cows in a season, besides bullocks and sheep. Oxen are frequently employed in the plough. There are large flocks of sheep kept by the more extensive farmers; the small farmers rarely keep any. The horses are generally of an inferior kind. The pigs are of a good breed. Poultry is abundant.

Of the 579,899 acres comprised in the county, there were in 1847 about 206,020 under crops, consisting chiefly of oats, wheat, and grass.

The only home manufactures are a little coarse linen, sometimes, though rarely, a little coarse frieze coating, and the knitting of coarse worsted stockings, which last branch of industry is pretty commonly done by girls, widows, and old women. Spinning and weaving, from the cheapness of manufactured goods, have almost entirely ceased.

Divisions and Towns.—Meath is divided into 19 baronies. It is in the diocese of Meath. It is in the Home circuit, and the assizes are held at Trim. The county returns 2 members to parliament.

The following are the principal towns, with the population of each in 1841:

Athboy, a small town, 7 miles N.W. from Trim, is watered by a stream called the Athboy River, a feeder of the Boyne. Population, 1826.

Drogheda is partly in Meath. [DROGHEDA.]

Kells, a very ancient market-town, is 10 miles N.W. from Navan, near the south bank of the Blackwater. It was formerly surrounded by a wall, and contained a well-endowed monastery. The town contains a sessions-house, a handsome Roman Catholic chapel, an ancient church, with a round-tower and cross in the church-yard, and an ancient stone-cross, richly carved, in the centre of the town. Population, 4205.

Navan, a market-town, is situated at the confluence of the Blackwater with the Boyne, 9 miles N.N.E. from Trim, and 20 miles by the course of the Boyne from Drogheda. The town consists of three main streets, from which several lanes branch off. It contains a handsome church and a spacious Roman Catholic chapel, a court-house, and a union workhouse. The town is situated in a very rich agricultural district, and much corn is sold at the weekly markets. Brewing, distilling, flax-spinning, and paper-making, are carried on. Population, 5628.

Trim, the county-town of Meath, 28 miles N.W. from Dublin, is situated on the banks of the Boyne, over which there is an old bridge. It is a very ancient place. The remains of a castle, built in 1220, occupy an area of four acres, and consist of the keep and various other towers and outworks. There are also some remains of an abbey, and a tower of great antiquity is connected with the parish church. The county court-house is a modern structure, and there is a new county-prison—a spacious building. Trim is not a place of much thoroughfare, and has little trade. Population, 2269.

History and Antiquities.—At an early period Meath constituted one of the kingdoms into which Ireland was divided. Teamor, now Tara Hill, near the Boyne, was the residence of the sovereign of Ireland, and the seat of the supreme government, and the place where St. Patrick made his first efforts for the conversion of the Irish to Christianity. The kings of Meath became afterwards tributaries to the kings of Ireland. In the invasions of the Northmen, or Danes, the kingdom of Meath suffered severely. Before the invasion of Ireland by Henry II., Dermod MacMurchad, king of Leinster, had reduced O'Melaghlin, king of Meath, and other princes, into a state of subjection; but a quarrel between some of these chiefs led to an invitation by one of them to the English to enter Ireland; and the result was that Richard Strongbow took possession of Meath (A.D. 1171), which was conferred by Henry II. as a county palatine on Hugh de Lacy, who was appointed governor of the English pale or district.

For a century and a half Meath was a scene of conflict, sometimes between the English and the Irish, and sometimes between the king and the powerful barons. The English dominion, never fully established, appears rather to have decayed during the reigns of the latter Plantagenet and the Lancasterian princes, and the civil war of the Roses. In the reign of Henry VIII. the power of the English began to revive, when the ancient county of Meath was divided, and West Meath, including the present counties of West Meath, Longford, and part of King's county, was formed into a separate county.

There are several remains of antiquity in the county. At Tara, once the seat of the Irish monarchs, are considerable earthworks. There are considerable ruins of the castles of Scurlogstown, Dunmoe, Athlumley, and Asigh. Slane Castle and one or two others have been fitted up as residences. There are round-towers at Kells and at Donoughmore near Navan. There are numerous ruins of ancient monastic edifices: those of the monastery at Duleek, supposed to be the most ancient monastic edifice built of stone and mortar in Ireland, present some remarkable traces of rude architecture. The front of the ancient cathedral at Clonard yet exists, and there are several stone crosses. The ruins of Bective Abbey are extensive and picturesque.

(Wakefield's *Ireland; Parliamentary Papers;* Harris's *Hibernica;* Gordon's and Cox's *History of Ireland.*)

MEATH, WEST, or as it is sometimes written

in one word, *Westmeath*, is an inland county of the province of Leinster in Ireland, bounded N. by Cavan, N.E. E. and S.E. by Meath, S. by King's County, W. by Roscommon, and N.W. by Longford. The greatest length E. to W. is 40 miles; the greatest breadth N. to S. is 35 miles. The area is 708 square miles. The population in 1841 was 141,300.

Surface and Geology.—The county is for the most part a gently undulating surface, not rising in any part to a very great height. The whole belongs to the central carboniferous limestone district of Ireland, with the exception of two small districts of yellow sandstone.

The western side of the county belongs immediately to the basin of the Shannon, which forms its western boundary. Lough Ree, the largest of the series of lakes into which that river expands, is also on the western border. This noble sheet of water is 15 miles long from north to south, and of a varying breadth, above 7 miles in one part. Its outline is exceedingly broken and irregular, and its surface studded with a number of small islands finely wooded, some of which have ecclesiastical ruins. The streams which flow into the Shannon or into Lough Ree are all small. There are many small lakes and small bogs.

The central part of the county is drained by streams that empty their waters into several inland lakes, which are connected by small streams with each other, and ultimately with the river Shannon. The chief of these lakes are Loughs Sheelin, Keinal, Glore, Iron, Glyn, Gar, Owhel, Ennel, and Deveragh. These lakes vary from 6 miles to 2 miles in length, and some of them are studded with small islands.

The eastern side of the county belongs to the basin of the Boyne. A number of small streams flow eastward into that river: the most important is the Deel. The lakes of this portion are Lough Bawn, the White Lake, and some very small ones on the borders; and Lough Lein and Lough-a-Deel within the border.

The eastern and south-eastern sides of the county abound with bogs, and some of them are of very considerable extent. The lakes of West Meath abound in pike and very fine trout.

Agriculture and Industry.—The landed estates in the county are not very large, but there are a number of gentlemen of moderate fortune. The soil comprises heavy loam, light loam, hilly sheep-walks, and a great deal of bog. The chief crops raised by the farmer are oats and potatoes; a very little wheat, some barley, flax, rape, and clover are grown. Dairy farming is practised to some extent in this county. The long-horned cattle are much valued; some of the best specimens are grazed in this county, and all the stock participate in the blood. Pigs and horses are more attended to than sheep. Of the 453,468 acres comprised within the county, there were, in 1847, about 127,953 under crops, chiefly oats and grass.

The manufactures of the county are not important; they consist chiefly of the most necessary articles, such as coarse linens, woollens, and cottons.

The Shannon is navigable for steam-boats conveying goods and passengers. The Royal Canal crosses this county from east to north-west. The principal roads are good. The Midland Great Western Railway passes through the county.

Divisions and Towns.—West Meath is divided into 12 baronies. It is in the diocese of Meath. It is in the Home circuit, and the assizes are held at Mullingar. The county returns 2 members to parliament, and one member is returned for the borough of Athlone.

The following are the principal towns, with the population of each in 1841:—

Athlone is partly in West Meath and partly in Roscommon. [ATHLONE.]

Kilbeggan, 14 miles S.S.W. from Mullingar, is situated on the upper Brosna, and is connected by a branch canal with the Grand Canal, by which corn and other agricultural produce are sent to Dublin. Population, 1910.

Moate, 10 miles E.S.E. from Athlone, contains a neat court-house, a church, Roman Catholic chapel, and meeting-houses for Methodists and Quakers. Population, 2095.

Mullingar, the county town of West Meath, is situated near the centre of the county, and is watered by the Brosna, here a small stream. It is the principal station on the Royal Canal between Dublin and Longford. It contains a court-house, county-gaol, church, a large Roman Catholic chapel, a nunnery, and a Wesleyan chapel. Population, 4569.

History and Antiquities.—This county was included in the kingdom of Meath, of which it formed the western division. In common with the rest of that kingdom it suffered severely both from the ravages of the Danes and from civil dissensions, and was included in the county palatine of Meath, granted by Henry II. of England to Hugh de Lacy. It was the scene of frequent hostilities for several centuries between the native Irish and the English. West Meath was separated from Meath or East Meath in the 34th of Henry VIII. In most of the subsequent dissensions it shared the fate of the parent county.

There are many vestiges of antiquity scattered through the county. There are numerous ruins of ancient castles, including some erected by the De Lacies. Sonnagh Castle, one of these, stands on the verge of a small but picturesque lake. Of monastic buildings there are several ruins; and some churches, formerly conventual, are still used for divine worship by Catholics or Protestants.

(Wakefield's *Ireland; Parliamentary Papers;* Harris's *Hibernica;* Gordon's and Cox's *History of Ireland.*)

MEAUX. [SEINE-ET-MARNE.]

MECCA, the birth-place of Mohammed, and the holy city of the Mohammedans, is situated in that part of Arabia which is called El Hedjaz or Hedj, about 21° 30′ N. lat., and 40° 20′ E. long., 70 miles from the Red Sea, in a straight line.

This city is situated in a narrow and sandy valley, bounded by mountains from 200 to 500 feet high. The streets of Mecca are broader than those of eastern cities in general, the houses lofty and of stone, and they have numerous windows

which give to the streets a more lively and European aspect than the streets have in Egypt and Syria. The only public place in the body of the town is the large square of the great mosque, which is only enlivened during the Hedj (Pilgrimage) by the great number of well-stored shops. The streets are all unpaved; and the town is badly supplied with water—mostly by an aqueduct from the vicinity of Arafat. Most of the houses are constructed for the accommodation of lodgers, and divided into numerous separate apartments, each consisting of a sitting-room and a small kitchen. Except four or five houses belonging to the sherif, two colleges, and the mosque, Mecca has no public edifices.

The mosque, called Beitullah (God's House), is only remarkable for the Kaaba, which it incloses. The Kaaba stands in an oblong square, surrounded by colonnades; on the east there are four rows of pillars, and on the other sides only three. They are united by pointed arches, every four of which support a small dome, plastered and whitened on the outside. The number of these domes is one hundred and fifty-two. Seven paved causeways lead from the colonnades towards the Kaaba, or Holy House, in the centre. The Kaaba is an oblong massive structure, constructed of the gray Mecca stone, in large blocks of different sizes, joined together in a very rough manner. The only door which leads into it is opened only two or three times in the year. At the north-eastern corner of the Kaaba, near the door, is the famous Black Stone. It is an irregular oval, about seven inches in diameter, composed of about a dozen smaller stones of different sizes, well joined together with cement and perfectly smoothed. Every pilgrim kisses this stone.

There are several other buildings within the area of the mosque, mostly appropriated to reading prayers, preaching, or the performance of devotions. The Zemzem, or holy well, is supposed to be the spring found in the wilderness by Hagar; it is inclosed in a square building of massive construction, and the well-room is beautifully decorated.

The inhabitants of Mecca, with few exceptions, are Arabians from different countries; but they have amalgamated, and they wear the same sort of dress and have adopted the same customs. With the exception of a few potteries and dyeing-houses, the people of Mecca have not a single manufacture. During the Hedj Mecca becomes one of the largest fairs in the East, and certainly the most interesting, from the variety of nations which frequent it.

Mecca is governed by a sherif, chosen from one of the many tribes of sherifs, or descendants of Mohammed, in the Hedjaz.

MECHAIN, PIERRE-FRANÇOIS-ANDRÉ, was born 16th August, 1744, at Laon, a town of France, in the present department of Aisne. An accident brought him under the notice and patronage of Lalande. The necessity of affording some pecuniary assistance to his father obliged Mechain to dispose of an astronomical instrument which, by rigid economy, he had recently been able to purchase. Lalande became the purchaser, and, after acquainting himself with the past history of Mechain, procured for him a government appointment as hydrographer, in which he was engaged in the construction of marine charts, and, jointly with M. Bretonnière, in the survey of the French coast between Nieuport and St. Malo. In 1791 the National Convention having determined upon employing the length of the arc of the meridian comprised between Dunkirk and Barcelona as the basis of their new measures, the measurement of the southern portion of this arc, between Rodez and Barcelona, was, at the recommendation of the Academy, confided to Mechain. The northern portion was allotted to M. Delambre. His skill as an observer is particularly mentioned by Delambre, and also the accuracy of all his calculations connected with the survey. Of this Mechain himself was unconscious. He had employed the repeating circle, an instrument which he regarded as absolutely infallible, and finding a difference of three seconds between his observations at Barcelona and Montjouy, he attributed it wholly to his own incapacity. Upon his return to Paris, which he reached with much personal risk, fearing to divulge this discrepance, he refused to deliver his papers to the Academy. The subject continuing to prey upon his mind, he applied, after several years, to the French Board of Longitude, and urged them to prolong the measurement of the arc from Barcelona to the Balearic Islands. To this the Board consented, but being unwilling to dispense with his services at the Paris Observatory, they suggested that Mechain should not be the conductor of the survey. This however would have been to relinquish the chief object of his application. He obtained permission to depart, but soon after his arrival in Spain he was attacked by an epidemic disorder, of which he died on the 20th of September, 1805, at Castellon, a town of Catalonia.

Before his departure he entrusted all the manuscripts referring to his previous expedition to M. Delambre. They have since been arranged and deposited in the Paris Observatory, together with so much of his correspondence as related in any way to the survey.

MECHANICAL POWERS is the name given to certain simple machines or engines, for these words are applied indifferently, either of which is occasionally used by itself in moving bodies or raising weights, or any of which are combined together in the formation of the complex constructions which are employed in manufactures and the arts.

The several machines to which the name of mechanical powers is applied are the LEVER, the WHEEL AND AXLE, the INCLINED PLANE, the WEDGE, the SCREW, and the FUNICULAR MACHINE.

The object proposed in every machine is to transmit a force from the point at which it is immediately applied to that at which some resistance is to be overcome or some operation to be performed; and, in the transmission, the intensity of the motive power is to be increased so that effects may be produced which could not be accomplished by that power alone. The increase of the power is obtained by causing part of the resistance which

is to be overcome to rest on the machine or on the fixed points which serve for its support, so that only the part which remains is opposed to the motive force. Thus a heavy body may be raised to a certain height from the ground by means of an inclined plane, on which part of the weight is destroyed by the reaction of the plane.

This manner of overcoming a resistance will serve to illustrate the fact that in every application of a mechanical contrivance to overcome a resistance, as much advantage is lost in respect of time or space as is gained in respect of power. For it is evident that, in order to raise the object vertically through a space equal to the height of the plane, it would be necessary to move it over a space equal to the length of the plane; that is, through a space which bears the same ratio to the vertical height as the weight of the object bears to the power required to move it up the plane.

An account of the application of the mechanical powers in the construction of complex machines would involve descriptions of most of the engines by which human labour is abridged or dispensed with; and therefore the reader is referred to works in which machines or engines are expressly described, such as Gregory's 'Mechanics,' vol. ii., and similar works.

MECHANICS is the science in which are investigated the actions of bodies on one another, either directly or by means of machinery.

The term is particularly applied to the mutual actions of solid bodies: the actions of fluids on solids form, in part, the subjects of *Hydrostatics* and *Hydrodynamics;* but these, as well as *Pneumatics,* are now frequently included under the general name *Mechanics.* When bodies are at rest and the actions are such as to maintain them in that state, the laws of the actions constitute that branch which is called *Statics;* but, when motion is concerned, the laws and phenomena constitute what is called *Dynamics.*

The invention of simple machines for moving masses of any material, which it might be beyond the unaided power of man to transport to a distance, must have taken place in the earliest ages of the world, but the steps by which the art of constructing machines advanced have not been distinctly recorded; and the work of Vitruvius on architecture is almost the only source from whence can be obtained an account of such as were in use in and before the time of that engineer (the age apparently of Vespasian). From the descriptions there given it appears that among the mechanical powers then in use were the lever, the windlass, and the assemblage of pulleys. Vitruvius describes a complex machinery, consisting of wheels driving each other by cogs or teeth; and he enters fully into the construction of engines for throwing darts or masses of stone. Wheels impelled by river currents acting on floating boards then gave motion to machinery for grinding corn; and wheels turned by men walking on them were used for raising water by buckets or otherwise. There are no distinct intimations of the existence of windmills till the 12th century. The expansive force of steam can

only be said to have become a moving power at the end of the 17th century, and then it was employed merely to raise water. Its general application to machinery must be dated from the year 1768.

In tracing the progress of discovery concerning the mathematical theory of mechanical action, we shall have little to notice till we come to the 16th century. It must be observed however that Aristotle, who left no department of nature untouched, has noticed, in his mechanical questions, the equilibrium of unequal weights on the unequal arms of a balanced lever. Sicily enjoys the honour of having given birth to the first philosopher who can properly be said to have been a theoretical mechanician: we allude to Archimedes, who died about 212 B.C., and in whose works there is direct evidence of an effort to determine the principle of equilibrium in machines. He shows that there must exist in every one body considered as an assemblage of smaller bodies, a centre of force (that is, a centre of gravity), and he proceeds, by the analysis of that day, to investigate the seat of the centre of force in a triangle, a parabola, and a paraboloid.

During about 1800 years, which elapsed between the time of Archimedes and that of Cardan, we have no other notices concerning the theory of mechanics than such as are contained in the 'Mathematical Collections' of Pappus, which amount merely to a statement that the ancients had reduced the theory of every machine to that of the lever, and an unsuccessful attempt to explain the cause of the equilibrium of a body on an inclined plane. The discovery of the true theory of the inclined plane was, about 1577, made by Stevinus a native of Flanders; and to Galileo we are indebted for the first reduction of mechanical propositions to purely mathematical formulæ. The most important discoveries of this philosopher were those which relate to the times of descent, the spaces descended, and the velocities acquired when bodies fall by the action of gravity. He made observations on the motions of pendulums and determined that the times of their vibrations are proportioned to the square roots of the lengths; he also gave theorems for the composition of two motions, when both are uniform, when both are accelerated, and when one is uniform and the other accelerated. Nor should we omit to state that he was the first to obtain expressions for the strength of materials in resisting the strains to which they are subject.

The theory of the motions of fluids was, apparently, first cultivated in Italy by Castelli, who wrote on the subject in 1638; and about the same time Torricelli discovered the existence of a space void of air in the upper part of a tube filled with mercury, its open end being immersed in a vessel of that fluid. The latter was subsequently led to the conclusion that the pressure of the atmosphere is the cause of the support of a column of mercury in a tube, and also of the ascent of water in pumps. Both of these writers were pupils of Galileo; and, soon after the time of this philosopher, the French mathematicians Descartes, Pascal, Fermat, and Roberval, prosecuted with

ardour the new science, as that of mechanics was called; and among the fruits of their researches may be named the determination of the centres of oscillation and percussion in a body or system of bodies vibrating about a fixed axis.

The laws of the collision of bodies, which had been in vain attempted by Descartes, were at length, and nearly at the same time, discovered by the English mathematicians Wallis and Sir Christopher Wren, and by Huyghens on the continent. The first of these, in his treatise 'De Motu' (1670), divides bodies into such as are hard and such as are elastic, and he explains the phenomena attending the shock of bodies of both kinds. The name of Huyghens has become celebrated from the discovery of the properties of cycloidal curves, and the attempt to make the lower extremity of a clock-pendulum vibrate in an arc of that kind, in order that the times of vibration might be equal, whatever were the extent of the arc described.

In 1687 Newton's great work concerning the mathematical principles of natural philosophy was first published, and from that time the mechanical sciences, which had hitherto been confined to the action of bodies on each other at the surface of the earth, were made to comprehend the laws of planetary motion. In the 'Principia,' as the work is called, it is assumed as an hypothesis, that all the bodies of the universe and all the particles of every body exert on each other mutual attractions: also that the planetary bodies were originally put in motion by impulsive forces; and from thence the rotations of these bodies on their axes, their revolutions in their orbits, and all the perturbations by which their movements are varied, are explained by means of the elementary theorem for the composition and resolution of motions. The oscillations of pendulums, the theory of projectiles, the movements of fluids, and the resistance opposed by the latter to the motions of bodies immersed in them, are also in the same work investigated at length.

Contemporary with Wallis, Wren, and Newton, in England, were, on the continent, the celebrated Leibnitz and the two elder Bernoullis, all of whom contributed greatly to the advancement of mechanical science by their investigations concerning the laws of motion in terrestrial bodies. Leibnitz proposed the determination of that curve along which a body descending would describe equal vertical spaces in equal times; James Bernoulli proposed to find the figure assumed by a flexible cord or chain when suspended at the extremities; and John Bernoulli to find the curve of swiftest descent.

The mathematicians who may be considered as the immediate successors of Newton were chiefly Euler, D'Alembert, and Clairaut; and in the works of the first of these are investigated all the circumstances attending the phenomena of rectilinear and curvilinear motion when a body in vacuo or in a resisting medium is subject to any forces whatever. But the most remarkable event in the history of the sciences, after the discoveries of the English philosopher, was the solution of the celebrated problem of the three bodies; or that whose object is to determine the motions of a body when attracted by and revolving about another, and continually disturbed by the attraction of a third. This was, at the same time (about 1752), and independently of each other, accomplished by the three learned men above named, and it now constitutes the basis of the whole planetary theory. The 'Mécanique Analytique' of La Grange, which was published in 1788, and the 'Mécanique Céleste' of La Place (1798 to 1825), contain some of the latest accessions which the mechanical sciences have since received.

The first general principle in mechanics is that of the equilibrium of bodies on a lever; and a knowledge of it may be ascribed to Archimedes. A second general principle may be conceived to be that of the composition of forces or motions, and its discovery is due to Galileo. La Grange treats as a third principle in mechanics that of *virtual velocities*. Indications of this principle are found in the writings of Galileo, Wallis, and Descartes, but John Bernoulli is thought to have been the first who showed its utility in resolving statical problems. A general method of solving mechanical propositions was discovered by D'Alembert.

Besides the principles above mentioned there occur in mechanical investigations several others, which it will be proper to state briefly in this place.

The preservation of living forces is an expression denoting, in a compound body, that the sum of the products of the mass of each body into the square of its velocity is constant.

The preservation of the centre of gravity is a principle denoting that the motion of the common centre of gravity of several bodies is not affected by the mutual attractions of the bodies. It was subsequently extended by D'Alembert.

The preservation of areas seems to have been discovered simultaneously by Euler, Daniel Bernoulli, and the Chevalier D'Arci, about 1750. It is an expression signifying that the sum of the products of the masses of revolving bodies into the areas described by their radii vectores about a fixed point is proportional to the time.

The principle of least action originally signified, that when bodies act on each other, the sum of the products of the masses into the velocities and spaces described is a minimum. But considered in the most general sense, agreeably to the extension given to it by La Grange, the principle consists in this: that in trajectories described by bodies subject to central forces, the integral of the velocity multiplied by the element of the orbit is always a maximum or a minimum.

MECHELEN, *Malines*, or *Mechlin*, a large town in the Belgian province of Antwerp, 13 miles by railway N. of Brussels, and 75 miles E. of Ostend, stands on the Dyle, a navigable feeder of the Schelde, in 51° 2′ N. lat., 4° 29′ E. long., and has a population of 24,000. All the Belgian railroads concentrate at Malines. The city is well-built and remarkably clean. The cathedral, which was built in 1451, and has a tower 348 feet high, the palace of the archbishop, who is primate of Belgium, the arsenal, which contains a cannon

foundry, the town-house, and the church of the Jesuits, are the chief public buildings. Malines is a place of great trade, and was formerly famous for its lace manufactures, but this branch of industry has of late years greatly declined. Hats, woollen-cloth, calico, paper, leather, brandy, beer, &c., are also manufactured, and there is an important commerce in corn, oil, hemp, flax, and hops.

MECKENEN, MEKENEN, or MECHELN, ISRAEL VAN, was, it is conjectured, born at Meckenen near Bocholt, in the middle of the 15th century. The identity of Meister Israel the painter and Meckenen the engraver has been the subject of much dispute; but it is now pretty generally believed that they were one and the same person. Israel Van Meckenen died in 1503. There are 18 fine old oil paintings worthy to be placed beside those of the Van Eycks in the Pinacothek at Munich, which are attributed to Meister Israel. Upwards of 300 prints attributed to him are extant, among which is a portrait of himself.

MECKLENBURG, a country in north Germany, lying between 53° 8′ and 54° 2′ N. lat., 10° 40′ and 13° 45′ E. long., consisting of the grand-duchies of Mecklenburg-Schwerin and Mecklenburg-Strelitz, and the principality of Ratzeburg, is bounded N. by the Baltic, E. by Prussia, S. by Prussia and Hanover, and W. by Lauenburg and Lübeck. The whole area is 5588 square miles, and the population in 1848 amounted to 618,448.

The surface of Mecklenburg may be described generally as a plain; the soil is partly loamy and fertile, and partly sandy and barren. A considerable part of the surface is covered with lakes; the largest of these lakes, Muritz, is 18 miles long by 8 broad. The chief rivers are—the Warnow, which is about 100 miles long, and falls into the Baltic sea at Warnemünde, below Rostock: the Recknitz, which falls into the Baltic further east, having in part of its course formed the boundary between Mecklenburg and Pomerania: the Elde and the Sude, feeders of the Elbe, which touches the south-western boundary at two points. The climate is healthy and temperate; but the winter is often severe. Agriculture forms the chief employment of the inhabitants; wheat, rye, barley, and oats are raised in large quantities for exportation. The forests produce some excellent timber. The breeds of horses, cattle, and sheep, are good, and the geese of Mecklenburg are celebrated for their size and flavour. Fish abound on the coast and in the lakes. The manufactures, though at present inconsiderable, are extending. The great majority of the inhabitants are Lutherans. The present constitution is founded chiefly on the compact between the princes and the estates in 1755. The grand dukes have the whole executive power. There are two assemblies,—that of the equestrian order, which includes all owners of noble estates; and that consisting of the representatives of the 44 towns. They meet annually at Sternburg and Malchin alternately. Mecklenburg was formerly inhabited by the Heruli and the Vandals; these were succeeded by Sclavonian tribes, whose prince, Pridislaus, was the ancestor of the succeeding sovereigns of Mecklenburg. The ducal title dates from 1340: the grand-ducal from 1815.

Mecklenburg is a member of the Germanic confederation. In the full council of the Germa Diet Schwerin had 2 votes, and Strelitz 1: i the select council they had together the 14th vot To the German National Constituent Assembl Mecklenburg returned 7 members, Schwerin member, according to the law of April 14, 184 The contingent for Mecklenburg to the army the Confederation, as fixed by the law of July 1848, consists of 5806 men.

Mecklenburg-Schwerin is divided into the circle of Mecklenburg, Wenden, the principality Schwerin, Rostock, and the lordship of Wisma It contains an area of 4824 square miles, and ha a population in 1848 of 524,042.

Bützow is the capital of the principality Schwerin. Population, 3600.

Güstrow, capital of Wenden district, is one the finest towns in the grand duchy. It wa formerly the residence of the princes. The mos remarkable buildings are the cathedral, containin some costly monuments of the reigning family and the old palace (now a House of Correction described as the finest princely residence of th middle ages in Mecklenburg. Population, 8620.

Rostock, capital of the district of Rostock, trading port, and the largest town in the gran duchy, is situated in 54° 5′ N. lat., 12° 20′ E long., on an eminence on the bank of the rive Warnow. It consists of the old, the middle, an the new towns. On the whole the old town i most irregular, the middle town the handsomes and the new town the most regularly built. Th principal buildings are the arch-ducal palace; th university; the court of justice; the town-hall and the churches of St. Mary and St. Peter—th former contains the tomb of Grotius, and possesse one of the finest organs in Northern Germany —the latter, built in the 12th century, is remark able for its fine steeple, 420 feet in height. Th university, founded in 1419, has 23 professors and possesses a library rich in Oriental an Spanish literature. Rostock is the principa trading port of Mecklenburg, and possesses abou 150 ships. The chief exports are corn and wool imports, colonial produce, wine, and bay salt There are manufactories of linen, soap, &c. Popu lation, 29,000.

Schwerin, capital of the grand duchy, and o Mecklenburg district, is situated in 53° 45′ N. lat. 11° 30′ E. long., on the west shore of the lak Schwerin. The town has a striking and importan appearance when viewed from a distance. It is long, irregular, and plain town, containing two o three fine buildings—the grand ducal palace which is built on an island in the lake, and is a old fortified structure, containing a good pictur gallery, and a museum;—a fine modern buildin appropriated to state business;—and an old gothi cathedral, 305 feet in length, and 135 in breadth The manufactures of vinegar, cloth, pottery, and tobacco, are not of much importance. Population 13,035.

Wismar, an important sea-port on Walpich Bay

is situated in 53° 53′ N. lat., 11° 35′ E. long. The harbour is not deep, but it is considered one of the safest in the Baltic. Wismar possesses from 60 to 70 vessels, and the entries into the harbour average 300 ships annually. The town is tolerably well built: the streets being broad and well paved. The principal buildings are—3 gothic churches; a handsome modern town-hall; and a fine lofty school-house. The exports consist chiefly of corn; the imports are mostly Swedish productions. Fishing, agriculture, and the manufacture of tobacco and linen employ a large portion of the population. Wismar was bought by Schwerin in 1803, of the Swedish government, for 1,200,000 dollars. Population, 10,000. The smaller towns of Schwerin are Parchim (pop. 5694), Ludwigslust, the residence of the grand duke (pop. 5000), and *Dobberan*, a bathing village near the Baltic coast, with a population of 2200.

Mecklenburg-Strelitz lies E. of Mecklenburg-Schwerin, and has an area of 626 square miles, with a population in 1848 of 78,995.

New Brandenburg, a pretty, circular town, with broad straight streets, is built near the Tollense lake; manufactures of woollen cloth, cards, paper, and tobacco are carried on. The grand duke has a palace in the town, and a country-house in the neighbourhood. There is an annual wool-fair; and horse-races are held in the vicinity. Population, 6000.

Stargard (called Old Stargard) is a small town with about 1000 inhabitants.

Strelitz, capital of the grand-duchy, situated in 53° 21′ N. lat., 13° 10′ E. long., consists of the old and new towns, which, though one mile apart, form one city. Old Strelitz is the seat of leather, tobacco, and pipe manufactures; and four annual fairs are held there. New Strelitz, founded in 1733, is built in the form of a star, with eight divergent rays. This town is the residence of the grand-ducal court. The most remarkable edifice is the ducal palace, which contains a library of 50,000 vols. and a curious collection of German antiquities. The inhabitants chiefly depend for their support on the expenditure of the court. The united population of the two towns is 9500.

Ratzeburg, a small principality belonging to Mecklenburg-Strelitz, and situated between Schwerin, Lübeck, and Lauenburg, has an area of 137 square miles, and a population in 1848 of 15,411. It is traversed by the river Trave, and is bounded on the west by the lake of Ratzeburg, by means of which timber, corn, pulse, flax, and cattle are sent to Lübeck for exportation. The inhabitants also carry on considerable fisheries. *Ratzeburg*, the chief town, mostly belongs to Lauenburg, with the exception of the cathedral and the hospital, which belong to Strelitz. It is the seat of the government of the principality, and has a population of 2400.

MECKRAN. [Beloochistan.]

MECONIC ACID, a substance which is found only in opium, in which it exists in combination with the alkali Morphia. It is named from *mecon* (μήκων), poppy. Meconic acid is a crystalline substance, which acts on litmus paper, and has a sour taste; it is soluble in four times its weight of water, and also in alcohol. The crystals do not alter by exposure to the air, but when heated to 212° they lose 21·5 per cent. of water, and become opaque. When strongly heated, it is totally vaporised and decomposed. It appears to consist of $O^7\ H^2\ C^7$.

The salts which contain this acid are called *meconates*. The chief among them are combinations of the acid with Ammonia, Potash, Soda, Lime, Magnesia, Barytes, and Iron: the whole of these crystallise.

When a solution of meconic acid is heated to ebullition, carbonic acid is evolved, and a brownish solution results; this consists of colouring matter and *metameconic acid*. When a meconate, as of potash or lime, is boiled with hydrochloric acid, no colouring matter results, and yet metameconic acid is formed. This acid is in hard anhydrous grains. *Pyromeconic acid* is a crystalline body, fusible between 248° and 257°, and then flows like oil: it is entirely soluble at a moderate temperature. The relation between the three acids is thus shown:—

1 Metameconic Acid
1 Carbonic Acid
} = 1 Meconic Acid.

4 Carbonic Acid
1 Pyromeconic Acid
1 Water
} = 2 Meconic Acid.

MECONIN, a neutral principle existing in opium. It is colourless and inodorous, is at first tasteless, but afterwards acrid; it is soluble in water, alcohol, and æther, and crystallises well in any of them; the crystalline form is a six-sided prism with dihedral summits; it fuses at 194°, and is volatilised at 310°, without undergoing any change of properties. It consists of $O^4\ H^4\ C^9$.

MECONO'PSIS (from μήκων, a poppy, and ὄψις, a resemblance), a genus of plants belonging to the natural order *Papaveraceæ*. There is only one species, *M. Cambrica*, the Welsh Poppy, and this is a native of Great Britain, but it is a rare plant. It is also found in many parts of Europe. It has yellow flowers, is an ornamental plant, and may be introduced into the garden. It will grow in a rich light soil, in a shady situation. It may be propagated by dividing the roots, or by seeds.

MEDAL. Numismatists have usually given the name of medals to those coins that have been struck or cast for particular purposes and on extraordinary occasions, in commemoration of victories, treaties, coronations, and similar important events, or in honour of remarkable persons, in distinction to those which have been issued and generally circulated as money. [Coin.]

Greek medals and medallions are very rare, few being known of earlier date than the establishment of the imperial power at Rome, and when Greece was under Roman dominion. Some of Sicily are not however so scarce; they are of very fine design and workmanship, and deserve the careful attention of the connoisseur. Roman medals are more common. Many of great excellence and in high preservation are contained in the collection of coins in the British Museum.

The earliest examples of modern medals and

medallions seem to be of the 15th century, though there is one remarkable exception to this in a medal of David II., king of Scotland. It is of gold, and was probably executed during that prince's captivity in England, sometime between the years 1330 and 1370. From the 15th century there is a succession of medals in most European countries. A gold medal of the council of Florence, dated 1439, is one of the earliest. A still earlier one, if the date 1415 is correct, is of John Huss; but some doubts have been entertained of its authenticity. Vittore Pisano, a painter of Verona, is celebrated as the restorer of the art at that period; but the medal alluded to of David of Scotland seems to prove that it was practised before his time. Pisano's medals are very large, and are all cast. They are usually inscribed 'Opus Pisani Pictoris.' It is curious that he should always refer to his being a painter while exercising a totally distinct branch of art. The papal medals commence properly with Paul II., who began to reign in 1464; those of pontiffs who lived prior to that date having been added to the collection by successors. The German medals commence in 1453, and are very numerous. The Sicilian medals appear as early as 1501. The Spanish medals begin in 1503. The earliest of Venice appear in 1509; and those of Denmark in 1516. The first Dutch medals seem to be of 1566, and they are remarkable for the elaborate views, maps, and plans that are engraved on many of them.

The French medals do not exhibit any remarkable excellence till the reign of Louis XIV. gave an impulse to the art, and we find his entire life illustrated by medals; some of them are well designed and finely executed. The medallic history of Napoleon deserves notice in the series of medals of France. It is of great extent, and is for the most part honourable to French art.

The series of English coins and medals is one of the most perfect. The first medal is of 1480. It is of a large size, and is executed in the early Italian manner. On one side is a portrait with IO. KENDAL. RHODI. TURCUPELLARIUS; on the reverse the arms of Kendal, with the inscription, TEMPORE OBSIDIONIS TURCORUM. MCCCCLXXX. The next English medal is of the time of Henry VIII. It is of gold, and bears the king's portrait on one side, with an inscription on the reverse. The first coronation medal appears in the reign of Edward VI. The medals of Queen Mary are numerous, and very interesting from the devices they bear. The Scotch coronation medal of Charles I. is of gold, and was struck at Edinburgh. It is remarkable as being the first struck in Britain with a legend on the edge.

Some remarks on the manner of engraving dies for medals and coins will be found in the article on Intaglio. [INTAGLIO.]

MEDALLION, a medal of a large size.

MEDALLION, in architecture, any circular or oval tablet bearing on it objects represented in relief, as figures, heads, animals, flowers, &c.

MEDE, JOSEPH, was born at Berden in Essex, the year 1586, and died in 1638. In 1602 he entered Christ's College, Cambridge, and took his degree of M.A. in 1610, and that of B.D. in 1618. He devoted his entire life, in the retirement of his college, to his studies, and has left, as the chief result of his application, his 'Clavis Apocalyptica,' said by Bishop Hurd to have been the first rational attempt to explain the Apocalypse. This work was translated by Mr. T. Bransby Cooper in 1833.

Mede's works were collected by Dr. Worthington in one vol. fol., Lond., 1672, with a life of the author prefixed.

MEDENBLIK. [HOLLAND.]

MEDEYAH. [ALGIERS.]

ME'DIA, a country of ancient Asia. In the time of Strabo it was divided into two divisions, Great Media and Media Atropaténe. Great Media, which is a high table-land, had a good climate and a fertile soil. It was separated on the west and south-west from the low country watered by the Tigris and Euphrates by a range of mountains called Zagros and Parachoatras; on the east it was bounded by a desert and the Caspian Mountains (the modern Elburz Mountains); and on the north and north-west by the Cadusii, Atropatene and the Matieni, thus answering for the most part to the modern Irak Ajemi. Atropatene, which corresponds to the modern Azerbijan, extended as far north as the Araxes (*Aras*).

The principal town of Great Media was Agbatana, or Ecbátana (Hamadan), the summer residence of the Persian kings. [ECBATANA.] In the north-east of Great Media, near the Caspian gates was the town of Rajæ (now Rai), afterwards called Europus by the Macedonians, and Arsacia by the Parthians, which was founded, or rather colonised, by the Macedonians under Seleucus Nicátor. (Strabo, p. 524).

The chief town of Atropatene was Gaza, or Gaziki, as it is called by Ptolemæus, at no great distance from the modern Tauris, or Taubreez. North-west of Gaza was a salt lake, called Spauta or Martianus (Shahee, or Ourmia).

According to Herodotus the Medes were originally divided into six tribes, one of which was the Magi (i. 101).

Media originally formed part of the Assyrian empire, but its history as an independent kingdom is given differently by Herodotus and Ctesias. According to Herodotus there were four kings of Media: 1, Deioces, who reigned B.C. 710–657; 2, Phraortes, B.C. 657–635, greatly extended the Median empire, subdued the Persians, and many other nations, but fell in an expedition against the Assyrians of Ninus (Nineveh). 3, Cyaxares, B.C. 635–595, extended the boundaries of the empire as far west as the Halys. In an expedition against Nineveh he was defeated by the Scythians, who had made an irruption into southern Asia. After the expulsion of the Scythians, he took Nineveh, and subdued the Assyrian empire, with the exception of the Babylonian district. 4, Astyages, B.C. 595–560, was dethroned by his grandson Cyrus, and Media reduced to a Persian province.

The Medes revolted during the reign of Darius II., the father of the younger Cyrus, about B.C. 408, but were again subdued. On the downf

of the Persian empire they formed a part of the kingdom of the Seleucidæ, and were subsequently subject to the Parthians.

MEDICA'GO (from *μηδική*, the Greek name of one of the species), a genus of plants belonging to the natural order *Leguminosæ*. The species are exceedingly numerous, upwards of eighty having been described.

M. sativa, Lucern, is super-eminent as an artificial grass in temperate climates, and a most valuable plant for feeding cattle. It was in high repute among the ancients. The authors 'De Re Rustica,' speak of it with enthusiasm, and all over the continent of Europe, wherever husbandry has made any progress, it is in high reputation. Lucern is a plant which will not bear extreme frost nor superabundant moisture, and its cultivation is therefore restricted to mild climates and dry soils; but, where it thrives, its growth is so rapid and luxuriant, that no other known plant can be compared to it. In good deep loams lucern is the most profitable of all green crops; when properly managed, the quantity of cattle which can be kept in good condition on an acre of lucern, during the whole season, exceeds belief. It is no sooner mown than it pushes out fresh shoots, and wonderful as the growth of clover sometimes is in a field which has been lately mown, that of lucern is far more rapid.

Lucern, sown in a soil suited to it, will last for many years, shooting its roots downwards for nourishment till they are altogether out of the reach of drought. In the driest and most sultry weather, when every blade of grass droops for want of moisture, lucern holds up its stem, fresh and green as in a genial spring. The only enemies of this plant are a wet subsoil and a foul surface. The first is often incurable; the latter can be avoided by good cultivation.

M. falcata is a native of Europe on dry mountainous pastures. In England it is a rare plant, but is occasionally found on dry gravelly banks and old walls. This species is said to be the lucern which is cultivated in Switzerland. *M. lupuline*, Black Medick, or Black Nonsuch, is a native of Europe in meadows, pastures, and waste grounds, and is plentiful in Great Britain. It affords excellent fodder for sheep, and must be treated in the same way as lucern. *M. arborea*, Tree Medick, is a native of the south of Europe, and appears to be the *κύτισος* of Theophrastus, 'Hist. Plant.' lib. 4, cap. 5. Besides the first three species, described above, *M. maculata*, *M. minima*, and *M. denticulata*, are natives of Great Britain.

ME'DICI, FAMILY OF. The oldest member of this family, of whom there is any distinct record, is Giovanni de' Medici, who, at the head of 100 Florentines, forced his way through the Milanese army in 1251. Other members of the family held important offices successively in Florence. The founder however of that greatness which his posterity enjoyed for several ages was Giovanni de' Medici, the great-grandfather of Lorenzo the Magnificent. By a strict attention to commerce he acquired great wealth; by his affability, moderation, and liberality, he ensured the confidence and esteem of his fellow-citizens. Without seeking after the honours of the republic, he was honoured with them all. He died in 1428, leaving two sons, Cosmo, born in 1389, and Lorenzo, in 1394, from the latter of whom is derived the collateral branch of the family, which in the beginning of the 16th century obtained the absolute sovereignty of Tuscany.

Even in the life time of his father, Cosmo had engaged not only in the extensive business by which the family had acquired its wealth, but also in the affairs of state. The authority which Cosmo and his descendants exercised in Florence, during the 15th century, consisted rather in influence than in any definite power. A party headed by Rinaldo d'Albizi attributed the unfortunate result of the war against Lucca to Cosmo, and obtained his banishment in 1433; but he was recalled in triumph within a year to enjoy for the remainder of his life uninterrupted prosperity. Though a private citizen, he surpassed almost all the princes of Europe in his munificent patronage of literature and the fine arts. He established at Florence an academy for the explanation of the Platonic philosophy, at the head of which he placed the celebrated Marsilius Ficinus. By means of foreign correspondence, he collected the Greek, Latin, and Oriental MSS., which formed the basis of the Laurentian library. He also endowed numerous religious houses, and built an hospital at Jerusalem for the relief of distressed pilgrims. By his prudent conduct and benevolence he acquired the title of 'father of his country,' which was inscribed upon his tomb; an appellation which, as it was founded on real merit, has ever since been attached to the name of Cosmo de' Medici. He died August 1, 1464. He had two sons, Giovanni and Piero; and a natural son, Charles, who was canon of Prato.

Giovanni de' Medici was one of the Florentine ambassadors who were sent, in 1455, to take the necessary oaths to Calixtus III., who had succeeded Nicholas V. He died in 1463. Piero de' Medici succeeded to Cosmo's fortune and authority at Florence. He was near falling a victim to a base plot contrived by his minister Neroni. Piero died Dec. 3, 1469, leaving by his wife, Lucretia Tornabuoni, two sons and two daughters, Lorenzo, Giuliano, Bianca, and Giovanna.

At the death of Piero de' Medici, his two sons inherited his property; but Lorenzo succeeded him as head of the republic. In 1472 he re-established the academy of Pisa: for this purpose he contributed a large sum from his private fortune, in addition to that granted by the state of Florence. Lorenzo, like his father, narrowly escaped a plot laid to assassinate him, by the Pazzi family. His brother however fell a victim to the conspirators. The citizens of Florence were so indignant at this atrocity that they killed two members of the Pazzi family, and hung the bishop of Pisa in his robes for assisting in the plot. This led to a war with Pope Sixtus IV., which was however soon after amicably brought to a close. Lorenzo now secured to the republic of Florence a degree of tranquillity and prosperity which it had scarcely ever known before; and by

procuring the institution of a deliberative body, of the nature of a senate, he corrected the democratical part of its constitution.

Lorenzo distinguished himself above all his predecessors by the encouragement of literature and the arts. His own productions are sonnets, canzoni, and other lyric pieces; some longer works in stanzas, some comic satires, carnival songs, and various sacred poems. Although the ancestors of Lorenzo laid the foundation of the immense collection of manuscripts contained in the Laurentian library, Lorenzo has the credit of adding very largely to the stock. On the discovery of the art of printing, Lorenzo appreciated its importance. At his suggestion several Italian scholars devoted their attention to collating the manuscripts of the ancient authors, for the purpose of having them accurately printed. On the capture of Constantinople by the Turks, many learned Greeks took refuge in Italy; and an academy was established at Florence for the purpose of cultivating the Greek language. Lorenzo also augmented his father's collection of the remains of ancient art. He appropriated his gardens in Florence to the purpose of an academy for the study of the antique. To this institution, more than to any other circumstance, Roscoe ascribes the sudden and astonishing advance which, toward the close of the 15th century, was evidently made in the arts, and which, commencing at Florence, extended itself to the rest of Europe. Lorenzo died in 1492. By his wife, Clarice Orsini, Lorenzo had three sons (Piero, Giovanni, and Giuliano) and four daughters arrived at the age of maturity. Piero was born Feb. 15, 1471, Giovanni in 1475, and Giuliano in 1478. Giovanni was afterward known under the name of Leo X.; and Giuliano, having allied himself by marriage to the royal house of France, became Duke of Nemours.

Giuliano, the brother of Lorenzo, left an illegitimate son, who was brought up under the protection of Lorenzo, and who was destined to act an important part in the affairs of Europe. The final extinction of the liberties of Florence, the alliance of the family of Medici with the royal house of France, the expulsion of Henry VIII. of England from the bosom of the Roman Church, are principally to be referred to this illegitimate son of Giuliano de' Medici, who under the name of Clement VII. guided the bark of St. Peter through a succession of the severest storms which it has ever experienced.

Piero, the eldest son of Lorenzo, succeeded him in the administration of Florence. The invasion of Italy by the French is matter of history. The plundering of the palace of the Medici, and the dispersion of the valuable library which they had collected, are among the misfortunes which befel Florence during the same period. Piero, by his base treaty with Charles VIII., prepared for the downfall of the state which his forefathers had contributed to raise and enlighten.

MEDICINE. The earliest records of the practice of medicine are extremely obscure. Among the Jews it appears to have been entirely confined to the priests, and the whole art seems to have consisted in the prevention of contagion by isolation and cleanliness, and the administration of a few uncertain remedies. The Egyptians, according to the account of Herodotus, must have made some little progress; purging medicines and emetics were well known to them and much used; and such was the subdivision of labour, that there were physicians for every separate complaint, some for the eyes, others for the head, others for the teeth, others for the abdominal parts, and others for diseases which did not manifest themselves by outward visible symptoms. (Herod., ii. 84). It appears, however, that in the time of Darius the son of Hystaspes, the Greeks possessed at least more skill than the Egyptians. (Herod., iii. 129). The Greeks probably derived their knowledge of medicine, with that of many other arts, from Egypt, whence Chiron, the Centaur of their fables, is said to have first introduced it among them. His pupil Æsculapius [ÆSCULAPIUS] so much improved the art, that he was deified; and Machaon and Podalirius, his sons, accompanied the Grecian army to the siege of Troy. The descendants of Æsculapius were for many years the chief practitioners of medicine: they were called Asclepiadæ, and were the priests of the temples erected in honour of their progenitor, to which the sick were accustomed to resort for advice and the application of remedies.

In the sixth century before the Christian æra, medicine, with other sciences, began to be more philosophically studied in Greece, and among the first of those who devoted much of their time to the investigation of the structure and functions of the animal body was Pythagoras. His pupils Democritus and Heraclitus appear also to have added considerably to the knowledge both of anatomy and of practical medicine, and their contemporary, Herodicus, first introduced the practice of gymnastic exercises, which afterwards formed so large a part of medical treatment. But the most remarkable man in the history of medicine in Greece was Hippocrates, one of the Asclepiadæ, who was born at Cos (where one of the chief temples was erected), B.C. 460, and was the pupil of Heraclitus and Herodicus. [HIPPOCRATES.] His sons Thessalus and Draco, and his son-in-law Polybius, were the most renowned of his descendants, and they are generally regarded as the founders of the medical sect or school which was called the Hippocratean or Dogmatic sect.

The establishment of the Alexandrian school of philosophy forms the next most important epoch. The science of medicine was assiduously cultivated, and the human body was first dissected in Alexandria by Erasistratus and Herophilus. [HEROPHILUS.] The former was the pupil of Chrysippus, a violent opponent of the Hippocratic school, and a bold innovator in medicine, with whom probably originated the schism in consequence of which, for some centuries, every physician ranged himself in one of two sects, the Dogmatists and the Empirics.

During the early periods of the Roman empire medicine seems to have been little cultivated, and, according to Pliny (xxix. 1), Rome was for 600 years without professed physicians, though not entirely without medical knowledge. The first individual of any eminence who practised medicine

in Rome was Asclepiades of Bithynia [ASCLEPIADES], who lived in the century before the commencement of the Christian æra; but he does not appear to have advanced the knowledge of the science. He was succeeded by his pupil Themison, the founder of a sect called Methodics, who held doctrines nearly intermediate between those of the Dogmatists and of the Empirics.

About two centuries later the Methodics were divided into numerous sects, as the doctrines of particular physicians became more generally received. The chief of these sects were the Pneumatics and the Eclectics. The former are represented by their most eminent writer, Aretæus [ARETÆUS], who lived in the reign of Vespasian, and the chief points of their doctrines are detailed in his life. Of the Eclectics, the most celebrated was Archigenes, of Apamea, who practised at Rome in the time of Trajan. But the most remarkable writer of this age was Celsus, in whose work, 'De Medicinâ,' the progress and condition of medicine previously to and during his life are amply detailed. [CELSUS.]

The individual whose history forms the next chief epoch in the history of medicine is Galen. [GALEN.] For a long time after his death physicians were chiefly occupied in commenting on his works, and imitating, as closely as they could, his practice. His writings were regarded as ultimate authority, and everything that seemed opposed to them was at once rejected. From the time of Galen to the seventh century the only names of any repute (and theirs is but small) are Sextus Empiricus, Oribasius, Aetius, Alexander Tralianus, and Paulus of Ægina; and, after the death of the last of these, no medical work of the least merit was published in the Greek language.

From the seventh to the twelfth century the only nation in which medicine made any progress, or was even prevented from retrograding, was the Arabian. It appears that in the conquest of Alexandria some books were saved from the burning of its magnificent library, and that among them were the writings of Hippocrates and Galen. The latter were soon translated into Arabic and diligently studied; and all the earliest Arabian works on medicine, as those of Ahrun in the eighth, and Serapion in the ninth century, are little more than transcripts of those of Galen. The most illustrious names of this school are Rhazes, Ali-Abbas, Avicenna, Mesue, Albucasis, Avenzoar, and Averroes.

From the decline of the Arabian school in the twelfth century to the beginning of the fifteenth, the history of medicine presents few circumstances of interest. The dissection of the human body was first publicly practised by Mondini at Bologna, about the year 1315; and at about the same time lived Gilbert, the first English writer on medicine who acquired any repute.

In the fifteenth century the sect of chemical physicians arose, and their doctrines, under the bold advocacy of Paracelsus, who publicly burnt the writings of Galen, obtained considerable credit and numerous supporters.

In the middle of the sixteenth century the most important improvement commenced in the diligent and accurate study of anatomy by Vesalius, who, disregarding the general obloquy which he incurred, carefully studied the structure of the most important parts of the human body.

From the time of Vesalius, the study of anatomy was diligently pursued, and in the early part of the seventeenth century was rewarded by several of the most interesting and important discoveries; as that of the circulation by Harvey, of the absorbents by Asellus, of the process of respiration by Malpighi, and numerous others. Among the most celebrated men of the seventeenth century, may be enumerated Glisson, Bartholin, Rudbeck, Fabricius, Hooke, Sylvius, Willis, Riolanus, Fallopius, Bellini, and Sydenham. Somewhat later appeared Stahl, Hoffmann, and Boerhaave.

Among the pupils of Boerhaave were Van Swieten and Haller. Before the time of Haller, the cases of Harvey, Glisson, Malpighi, and others, who devoted themselves to the simple observation of facts and the evident deductions from them, were exceptional; but since his time, the exceptions have rather been those who, with a comparative neglect of observation, have endeavoured only to find or support some theory by which all the phenomena they met with might seem explained. Haller's contemporary Cullen [CULLEN], though he yielded much more to theory, was of eminent service in the study of practical medicine; and his opponent Brown is acknowledged to have introduced many useful lessons in the same branch of the study.

With the gradual oblivion of the hypotheses of both Cullen and Brown, the theoretical study of medicine may be considered to have entirely ceased, and in the present day we may certainly be said to be without any general medical theory. From the time of Haller, medicine has acquired more and more nearly the character of a science of simple observation and the patient investigation of facts.

MEDICK. [MEDICAGO.]

MEDINA, the second holy city of the Mohammedans, and the place where their Prophet was buried, is situated in that part of Arabia which is called El Hedjaz, or Hedj, about 25° 15′ N. lat., and 39° 30′ E. long., and about 110 miles from the town of Yembo on the Red Sea, which is the harbour of Medina.

The city forms an oval, ending in a point. The castle is built at the point on a small rocky elevation, and is strongly fortified. The whole is inclosed by a thick wall of stone, between thirty-five and forty feet high, flanked by about thirty towers and surmounted by a ditch: it is well fortified for an Arabian town, and has always been considered the principal fortress in Hedjaz. Three well-built gates lead into the town. The houses are well built, entirely of stone, and generally two stories high. As the stone is of a dark colour, the streets have rather a gloomy aspect, and are for the most part very narrow, often only two or three paces across; a few of the principal streets are paved with stone. The diminution in the number of pilgrims of late years has caused a great part of the houses to fall into decay. There are only two large streets which contain shops. The great mosque containing the tomb of

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Mohammed is the only temple. There are two fine medresses or colleges. The suburbs extend on the west and south of the city, and cover more ground than the city. They are separated from it by an open space, narrow on the south, but forming on the west a large public place. The greater part of the suburbs consist of large court-yards with low houses built round them, and separated from each other by gardens and plantations: they are inhabited by the lower classes of the town, and all those who are engaged in agriculture. Each court-yard contains thirty or forty families, so as to form a hamlet by itself.

The town is supplied with sweet water by a subterraneous canal which runs from the village of Koba, about three-quarters of a mile distant in a southern direction; and there are numerous wells attached to the houses. This plentiful water-supply made Medina a considerable settlement of Arabs long before it became sacred among the Mohammedans by the flight, residence, and death of the prophet.

The mosque containing the tomb of Mohammed is situated towards the eastern extremity of the city, and, like that of Mecca, forms an open square surrounded on all sides by covered colonnades, with a small building in the centre of the square. The colonnades are much less regular than those of Mecca. Near the south-eastern corner of the mosque stands the famous tomb, detached from the walls so as to leave between it and the southern wall a space of about twenty-five feet, and fifteen between it and the eastern wall. The inclosure which protects the tomb from visitors, is formed of a very close iron railing, pierced with several small windows. This inclosure is entered by four gates, three of which are constantly kept shut, and one only is opened every morning and evening to admit the eunuchs, whose office it is to clean the floor and light the lamps. The whole of the inclosure is covered with a lofty dome, rising far above the domes which form the roof of the colonnades, and is visible at a great distance from the town. As soon as pilgrims to Medina catch sight of it they repeat some prayers.

The inhabitants of Medina, like those of Mecca, are not Bedouins, but strangers who have come to the place as pilgrims and afterwards settled there, or they are descendants of such strangers. Medina is not so great a place of commerce as Mecca, and the merchants are not so rich, but it has the advantage of having a considerable tract around which is fit for cultivation.

MEDITA'TIO FUGÆ WARRANT, in the law of Scotland, is a writ by which a debtor, supposed to be about to make his escape from the country, is arrested and kept in custody, until he pay the debt, or find security to pay it, if he shall be judicially found liable to do so.

MEDITERRANEAN (or *Midland-Sea*), the name of the sea between the Straits of Gibraltar to the west and the Dardanelles and Syria to the east. It is comprised between the parallels of 30° 15′ and 45° 50′ N. lat., and the meridians of 5° 30′ W. and 36° 10′ E. The distance from Gibraltar to the farthest shore of Syria is 2000 miles, and the narrowest part, between Sicily and Africa, i 79 miles across. The Mediterranean, including the islands, occupies an area of 734,000 square miles. The surface of country of which it receive the drainage is very difficult to estimate, but may be assumed to exceed this quantity.

The shores of Syria are mountainous betwee Tripoli and Tyre, but present in many places large extent of low and flat coast. The coast o Anatolia, the west portion of Asia Minor, i mountainous, rising in some parts very near th sea to 7000 and 8000 feet. About 20 league from the nearest coast of Syria is the island o Cyprus. The island of Candia, the name give by the Venetians to the ancient Crete, and th island of Rhodes, are also in this part of th Mediterranean. The numerous islands in the se called the Ægean Sea, between Greece and Asi Minor, forming the Grecian Archipelago, are sub ject to very heavy squalls. The sides of th islands being steep, and the water very deep there are in general no anchorages except in part cular places. The Archipelago and its coast contain many high mountains, as Athos, 677 feet high, and many others. The coast of th Morea, the ancient Peloponnesus, is mountainou some of the summits exceeding 6000 feet. Th coast of Albania, including the ancient Illyricum is more mountainous and rugged. Off this coa and the Morea lie the Ionian Islands. Proceed ing northward we enter the Adriatic, the entran of which is 40 miles broad. The shores of Da matia and Istria afford numerous fine harbours and above Ragusa the eastern shores are studde with islands affording good anchorage.

The Greeks, especially the Hydriotes, a active sailors. They employ small vessels, ha decked, which both sail and pull, but they seldo venture to sea except in fine weather or with fair wind. The trade to the Black Sea is chief carried on in Greek bottoms. But the coastin trade of the Adriatic is chiefly carried on Austrian vessels and those of the Papal State The vessels employed are mostly trabaculos, kind of lugger, and seltees, small vessels of o mast.

The southern extremity of Italy is contiguo to Sicily; between them being the well-know Scylla and Charybdis. Scylla is considered these days as an ordinary rock, but Charybdis a vortex which might, on occasions, prove da gerous to a small vessel. The coasting trade carried on in small Italian vessels.

The Gulf of Lions, like all the gulfs on t north shores of the Mediterranean, is subject violent gales from the northward, which son times last three days.

The islands of Sardinia and Corsica, lyi north and south, extend over 80 leagues of t sea between Genoa and Tunis. The small isla of Malta is, from its situation in the narrow between Sicily and Africa, and its excellent h bour, the great naval station of the Medit ranean, and second in importance to Gibraltar.

The east coast of Spain presents numerous h bours, and is particularly adapted to navigati by steam-vessels. The Balearic Islands, Major

Minorca, with Iviza, are adjacent to the Spanish coast. Gibraltar, standing at the foot of a rocky mountain, 1430 feet high, is a place of extraordinary strength. From its situation, and the narrowness of the straits dividing Spain from Africa, which are only eleven miles across, Gibraltar is the key of the Mediterranean. A constant current sets through the Straits of Gibraltar from the Atlantic at the rate of two or three miles an hour, and is felt as far as Cabo de Gata in Spain, 150 miles distant. Dr. Halley supposed this current required to supply the loss by evaporation, considering that the rivers which flow into this sea were not sufficient for the purpose.

Ceuta, opposite Gibraltar, is a fortress of great strength. The African shore from this place to Tripoli is hilly, and in some places sandy and sterile. On the low shelving shores of parts of these coasts the strong northerly winds do not blow home, and accordingly a ship may bear up in a lee shore and anchor in smooth water. Proceeding towards Barca, the ancient Ptolemais, we pass the Gulf of Sydra, or Greater Syrtis, an object of so much dread to the ancient seamen on account of marshes and sea-monsters. Capt. Smyth, who examined this coast, found that these terrors were poetical exaggerations of the difficulties of navigating a low and dangerous right. Passing the desert shores of Libya, we arrive at Alexandria, founded on a sandy neck of land; and on the low and fertile shores of the Delta at the mouth of the Nile the ports of Rosetta and Damietta.

The navigation of the Mediterranean must no doubt be of very early date. The story of Minos destroying pirates (Thucyd., i. 4) takes for granted the fact, that there must have been merchant vessels carrying something worth stealing from the earliest recorded period. That the Phœnicians and the Carthaginians navigated the Mediterranean at a very early date is quite certain. Strabo, who described this sea in the first century of the Christian era, describes the Mediterranean as being divided into three basins: the first comprised the sea between the Columns of Hercules and Sicily; the second, between Sicily and Rhodes; and the third, between Rhodes and the shores of Syria. His geographical positions, when tested by modern exactness, are found to be frequently wide of the truth.

This sea is navigated by vessels of no great size. There is a form of rig peculiar to the larger vessels, called *polacca*, which has originated in the suddenness and frequency of squalls, which often require the sail to be instantly taken in: for this purpose the masts are made in one piece, and the topsails, on being lowered, can slide down without interruption. The gales, though frequent and violent, never last long. The winds have been remarked as peculiarly variable in the Mediterranean, and three or four vessels have often been seen carrying different winds at the same time. The sirocco, or south-east wind, has always been noted for its depressing effects upon the animal system. Water-spouts are very common. The depth of the Mediterranean is without doubt very great, the sea being in most places unfathomable. Though poetically termed a 'tideless sea,' it is not strictly so; since in its latitudinal extent between Venice and the Lesser Syrtis it experiences a rise and fall of from five to seven feet; and there are slight tides in other places. Currents are numerous and strong.

MEDLAR. [Fruit.]

MEDOC. [Gironde.]

MEDU'SA (Zoology), the Linnæan name for a genus of simple or free *Acalephans* vulgarly known to the British by the name of *Sea-Blubbers* or *Sea-Nettles*, extremely transparent, difficult to observe in their native element, and still more difficult to preserve, from their gelatinous and easily decomposed texture. These beautiful but evanescent animals are very numerous, swarming on many of our coasts and in our æstuaries, and occurring in almost all latitudes. [Acalephæ.]

MEDWAY. [Kent.]

MEERMAN, GERARD, was born at Leyden in 1722. He spent the greater part of his life in learned research, chiefly relating to law. He died at Aix-la-Chapelle, Dec. 15, 1771. His two great works were, viz. 'Novus Thesaurus Juris Civilis,' &c., 7 vols. fol., 1751–53 (to which his son added an eighth volume in 1780), and his 'Origines Typographicæ,' 2 vols. 4to., Hagæ, 1765.

MEERMAN, JOHN, son of the preceding, was born in 1753. His earliest literary effort was made at the age of ten years, in a translation into Dutch of the 'Mariage Forcé' of Molière. Among his more important works was the 'Specimen Juris Publici de Solutione Vinculi quod olim fuit inter sacrum Romanum Imperium et Fœderati Belgii res publicas.' He also wrote a 'History of William, Count of Holland, King of the Romans,' and several other historical works, all in Dutch. He also published 'Hugonis Grotii Parallelon rerum publicarum, liber tertius de moribus ingenioque populorum, Atheniensium, Romanorum, Batavorum,' with a translation into Dutch, and 'Grotii Epistolæ ineditæ.' His last publication was a translation into Dutch of Klopstock's 'Messiah.'

Under Louis Bonaparte, as King of Holland, he was made Director of the Fine Arts and Minister of Public Instruction. When Holland became united to France, he was made a count of the empire and senator by Napoleon. He died August 15, 1815.

MEERSCHAUM, a magnesian mineral found in the island of Samos and Negropont (Eubœa), in the Archipelago, &c. It is employed chiefly in the manufacture of tobacco-pipes.

MEGALO'PA, Dr. Leach's name for a genus of Macrurous Crustaceans (*Macropa* of Latreille). Example, *Megalopa mutica*, found by M.M. Audouin and Brongniart at the mouth of the Loire.

MEGALOSAU'RUS, the name assigned by Dr. Buckland and the Rev. W. Conybeare to an extinct genus of Saurians found in the oolitic slate at Stonesfield, near Woodstock, and other localities. Huge fragments have been discovered in the ferruginous sandstone of Tilgate Forest in Sussex; and on the continent in the oolite of Normandy; in the marble of Caen; and on the Jura, near Solothurn, according to H. Von Meyer.

Though no entire skeleton has yet been discovered, the number of bones and teeth collected give sufficient data to enable the observer to pronounce upon the general osseous structure, with almost as great a certainty as would be the result of the examination of the bones of the animal in a perfect and connected state.

The femur, or thigh-bone, and tibia, or leg-bone, are nearly three feet in length severally, so that the entire hind leg must have been nearly two yards long, and the discovery of a metatarsal bone measuring thirteen inches indicates that the foot was of a corresponding length. From these and other remains, including the vertebræ, teeth, &c., the size of this gigantic saurian has been calculated and its habits ascertained. The individual whose enormous thigh-bone (now in the British Museum) was obtained from the sandstone of Tilgate Forest, must have equalled the largest elephant in stature, and have measured from sixty to seventy feet in length.

That this gigantic lizard was carnivorous, the structure of its teeth sufficiently declares; and the internal structure of the cylindrical and other bones shows that it was a terrestrial animal, though it may have occasionally taken to the water in pursuit of prey, such as Plesiosauri and fishes. Its ordinary food is supposed to have been the smaller reptiles, crocodiles, and tortoises, whose remains occur abundantly in the strata where those of Megalosaurus abound.

(Cuvier's *Ossemens Fossiles;* Mantell's *Geology of Sussex; Geol. Trans.*, vol. iii., 2nd series; Buckland's *Bridgewater Treatise.*)

MEGAPO'DIDÆ (Gould).—'The genera *Talegalla, Leipoa,* and *Megapodius,* form part of a great family of birds inhabiting Australia, New Guinea, Celebes, and the Philippine Islands. Their habits and economy are most singular, and differ from those of every other group of birds which now exists upon the surface of our globe. In their structure, they are most nearly allied to the *Gallinaceæ,* while in some of their actions and mode of flight, they much resemble the *Rallidæ;* the small size of their brain, coupled with the extraordinary means employed for the incubation of their eggs, indicates an extremely low degree of organization.

'The three species of the family inhabiting Australia, although referable to three distinct genera, have many habits in common, particularly in their mode of nidification, each and all depositing their eggs in mounds of earth and leaves, which becoming heated, either by the fermentation of the vegetable matter or the sun's rays, form a kind of natural hatching apparatus, from which the young at length emerge fully feathered, and capable of sustaining life by their own unaided efforts.'—Gould in Introduction to the 'Birds of Australia.'

ME'GARIS, one of the political divisions of ancient Greece, was separated from Bœotia by the range of Mount Cithæron, and from Attica by the high land which descends from the north-west boundary of Attica, and terminates on the west side of the bay of Eleusis in two summits, formerly called Kerata, or the Horns, and now Kandili. Megaris was divided from the Corinthian territory on the west by the Oneian range of mountains, through which there were only two roads from the territory of Corinth into Megaris.

Megaris is a rugged and mountainous country, and contains only one plain of small extent, in which the capital, Mégara, was situated. The area was probably about 700 square miles. The rocks are chiefly calcareous. The country is very deficient in springs.

Megara was built on two hills, and connected with the port of Nisæa by two walls, which were built by the Athenians when they had possession of Megara, B.C. 461–445. (Thucyd., i. 103.)

Megaris in early times belonged to Attica, but it was taken from the Athenians by the Dorians, and a Corinthian colony was settled at Megara. It remained for some time subject to Corinth; but it afterwards asserted its independence. Megara planted many colonies, of which the most important were Selymbria, Chalcédon, and Byzantium, on the Bosporus and the Propontis, and Hyblæan Megara in Sicily. The history of this little state is inseparable from the general history of Greece.

MEGA'STHENES lived in the time of Seleucus Nicátor, king of Syria, who sent him on an embassy to Palibothra, the capital of Sandracottus, king of the Prasii. Megasthenes stayed in India several years, and on his return recorded his observations in a work entitled 'Indica.' Of this work, which is unfortunately lost, there are extracts in Strabo, Arrian, and Ælian. Megasthenes gave the first account of Trapobane, or Ceylon.

MEGATHE'RIIDÆ, the *Megatherioids* of Owen, who includes under this family the following genera of extinct Edentata:—*Megatherium, Megalonyx, Glossotherium, Mylodon, Scelidotherium,* and others.

It is in America only that the remains of these massive animals have been found; and we may add, it is only within the last few years that the number of relics collected by enterprising travellers has enabled the philosophic anatomist to correct some errors, and to throw a new light upon the former history of the class Edentata. For a long time, the museum of Madrid afforded the only relics of the Megatherium in Europe; they were found on the banks of the river Luxan, south-west of Buenos Ayres, and sent over in 1789; but the skeleton they compose is deficient in several of its parts. Nevertheless Cuvier was enabled to determine with wonderful accuracy the affinities of this extinct giant of the Edentata.

Recently, the acquisition of a great portion of the bones of one of these animals by the Royal College of Surgeons, London, has tended to supply the deficiency of our information on many points which still remained obscure. These remains were discovered in the bed of the River Salado, which flows through the pampas a short distance south from the city of Buenos Ayres, during an unusually dry period of three years, and presented by Don Hilario Soza, the owner of the property on which they were found, to Sir Woodbine Parish, who liberally transmitted them to the College, with other remains collected in the

same locality. Among these remains were portions of an immense armadillo-like shell or crust, of osseous structure, consisting of rosettes united by sutures.

With such materials before him, Mr. Clift applied himself to the drawing up of a paper, entitled 'Some account of the Remains of the Megatherium sent to England from Buenos Ayres by Woodbine Parish, Jun., Esq., F.G.S., F.R.S., by William Clift, Esq., F.G.S., F.R.S.'

It was natural for Mr. Clift to suppose that the portions of dense tessellated armour found with the relics in question once formed the covering of this ponderous beast, and in this opinion Dr. Buckland and other scientific men coincided. It has however, been since demonstrated by Professor Owen ('Geol. Proc.,' 1839), that this tessellated armour does not belong to the Megatherium, but to a large armadillo-like animal, to which the Professor has assigned the name of *Glyptodon*, and whose hind feet, like the fore feet, appear to be so modified as to form the bases of columnar limbs destined to support an enormous incumbent weight. Moreover, from a rigorous examination of the details of the skeleton of the Megatherium, he proves the incompatibility of such a shield with its osseous structure. The writer of an article on the *Megatherium* in the 'Penny Cyclopædia,' says—

'Sir Woodbine Parish has just now (May 29, 1839) kindly communicated to us a letter received by him, giving information of the discovery of an almost entire skeleton of an adult *Megatherium* on the banks of the Rio de la Matanza, with all the vertebræ of the body, all the ribs, all the teeth, the head, and the legs, in short, the whole of the bones except the tail and one foot. Close to it was the skeleton of a *'Tatou gigantesque'* (Glyptodon probably), with its bony armour complete. There was also found a very small and perfect *Megatherium*, which must have been only just born at the epoch of destruction. No mention is made of any traces of bony armour or shell about the *Megatheria*. In the old animal only one foot is wanting. It has been suggested that the so-called young *Megatherium* may possibly be a skeleton of *Scelidotherium*.'

The *Megatherium* must have been a most extraordinary animal. With the head and shoulders of a sloth, it combined in its legs and feet an admixture of the characters of the ant-eater and the armadillo. Its haunches were more than five feet wide, and its body fourteen feet long and more than eight feet high; its tail was massive and broad; its feet were a yard in length, and terminated by most gigantic claws. Heavily constructed, its movements were slow; it could neither run nor leap; but it could tear up the earth from the roots of trees, and then, raised up on a tripod, composed of the hinder limbs and tail, wrestle with the trees of the forest, tear them down, and thus gain access to their leaves and tender shoots or branches.

The following comparative admeasurements, furnished by Mr. Clift, are in Sir Woodbine Parish's work entitled 'Buenos Ayres and the Provinces of the Rio de la Plata:'—

	Elephant. ft.	in.	Megatherium. ft.	in.
Expansion of the ossa ilia	3	8	5	1
Breadth of the largest caudal vertebra . . .	0	7	1	9
Circumference of middle of femur	1	0	2	2
Length of the os calcis .	0	7½	1	5

'The collection of fossils,' says Prof. Owen, 'brought to England from South America by Mr. Darwin has enabled me to add the following facts to the history of the Megatherium. Its teeth, for example, do not differ in number from those of the sloths, there being five on each side of the upper jaw. Microscopic examination having demonstrated a marked difference in the intimate structure of the teeth of the sloths and armadillos, I have ascertained by this mode of investigation that the teeth of the Megatherium have the same texture and composition as those of the sloth. And if, from identity of dental structure in two different animals we may predicate a similarity in their food, a glance at the bony framework of the Megatherium is sufficient to show that it must have resorted to other means of obtaining its leafy provender than that of climbing for it, whereby the necessity of inferring a proportionate magnitude of the trees which nourished the Megatherium is obviated.'

In Professor Owen's admirable memoir on the *Mylodon* and other extinct gravigrade Edentata, the mode in which these animals struggled with the trees, and the peculiarities of their muscular forces, as well as of the nerves which supply the muscles, are depicted with graphic eloquence.

The Megatherium appears to have been furnished with a small proboscis as an adjunct to the tongue in stripping off the twigs and small branches of the prostrate trees; and, as in *Mylodon*, the two tables of the skull are widely separated by extensive cells.

With respect to the *Megalonyx*, it was obviously related to the Megatherium, but was of inferior size, not exceeding an ox in stature, though more solidly and heavily built. Its relics are apparently more rare than those of the Megatherium, —they have been found in the cave of Lassa Grande, in Brazil, and also in the Big-Bone Cave of Tennessee, United States. (Dr. Harlan, in 'Medical and Physical Researches,' p. 323, &c.)

The genus *Gossotherium* (Owen) is founded on a fragment of a cranium in Mr. Darwin's collection, discovered in the bed of the same river in Banda Oriental in which the skull of the *Toxodon* was found. The fragment includes the parietes of the left side of the cerebral cavity, the corresponding nervous and vascular foramina, the left occipital condyle, a portion of the left zygomatic process, and the left articular surface of the lower jaw. No tooth nor locomotive extremity was present to lend its aid; and yet, upon the slender materials above stated, Professor Owen has been enabled to give generic distinction to the animal to which they belonged, and to fix its place in the animal series satisfactorily. (See Prof. Owen's 'Fossil Mammalia,' forming part of the

'Zoology of H.M. ship Beagle, under the command of Captain Fitzroy, R.N.')

Allied to *Megatherium* is the genus *Mylodon* (Owen), of which three distinct species have been described, viz. *M. Darwinii*, *M. Harlani*, and *M. robustus*, which far exceeds the others in size. An almost perfect skeleton of this last animal is preserved in the museum of the Royal College of Surgeons. Like the Megatherium, it was formed for tearing down the trees of the forest, after having partially laid bare their roots. In stature it equalled a rhinoceros, but with bones infinitely more massive, muscles infinitely more voluminous and powerful. Its thick muscular tail conjoined to form with the hind limbs a firm tripod, which sustained the animal upright, while, exerting its enormous strength, it swayed the tree to and fro, and at last pulled it down.

The gigantic and astonishing skeleton in question was discovered, as we are informed by Professor Owen, 'in the year 1841, by M. Pedro de Angelis, seven leagues north of the city of Buenos Ayres, in the fluviatile deposits constituting the extensive plain intersected by the great Rio Plata and its tributaries, and which has been raised during a recent geological epoch above the level of the sea.

'In this formation, and most probably anterior to its elevation, the animal must have been buried entire, for the parts of the skeleton were found little disturbed, and the very few bones that are wanting are such as would be likely to escape the search of the most diligent collector.

'About the same time, and near the same place, a tessellated osseous carapace of some large quadruped like an armadillo was exhumed, and information of this discovery having been communicated to the Royal College of Surgeons by Sir Woodbine Parish, late Her Majesty's Chargé d'Affaires at Buenos Ayres, both the carapace and the above mentioned skeleton were purchased by the College.' This carapace is the shell of *Glyptodon Clavipes* (Owen).

The *Scelidotherium* (Owen), was a large edentate quadruped, allied to *Megatherium* and *Orycteropus*. [Aard-Vark.]

The remains on which this genus is founded include the cranium, which is nearly entire, with the teeth, and part of the os hyoïdes; the seven cervical vertebræ, eight dorsal and five sacral vertebræ, both scapulæ, the left humerus, radius and ulna, two carpal bones, and an ungual phalanx; the two femora, the proximal extremities of the left tibia and fibula, and the left astragalus.

These bones were discovered by Mr. Darwin at Punta Alta in Northern Patagonia, and in the same bed of partly consolidated gravel as that wherein the lower jaws of *Toxodon* and *Mylodon* were imbedded. All the parts were discovered in their natural relative position, indicating, as Mr. Darwin observes, that the sublittoral formation in which they had been originally deposited had been but little disturbed. This beach is covered at spring-tides, and many portions of the skeleton were encrusted with *Flustræ:* small marine shells were lodged within the crevices of the bones.

Sufficient of the cranium remains to indicate that its general form resembled an elongated, slender, subcompressed cone, beginning behind by a flattened vertical base which expanded slightly to the zygomatic region, and thence contracted gradually in all its dimensions to the anterior extremity.—(See Owen, in 'Zoology of H.M. ship Beagle;' also 'Memoir on Mylodon.')

We may here refer to the *Comptes Rendus* (April, 1839), in which appears an extract of a letter from M. Lund to M. Victor Audouin, dated the 5th of November, 1838, giving an account of the discovery by M. Lund of numerous fossil mammals in Brazil. The portion of the country examined by this zealous zoologist is comprised between the rivers Rio das Velhas, one of the confluents of the Rio de S. Francisco, and the Rio Paraopeba. This tract forms an elevated plateau of 2000 feet above the level of the sea, and is traversed in the midst by a mountain-chain only from 300 to 700 feet high. The chain is formed by a secondary limestone stratified horizontally. It is full of caverns, and traversed in all directions by fissures, the interior of which is more or less filled with a red earth identical with the red earth which forms the superficial bed of the country. In this basin of the Rio das Velhas, M. Lund has discovered in company with the remains of *Feræ*, *Glires*, *Pachydermata*, *Ruminantia*, *Marsupialia*, *Cheiroptera*, and *Simiæ*, numerous fossil remains of the Edentate order, proving how manifold were once the forms which belonged to this now limited section of the class Mammalia.

MEHUN. [Cher.]

MEIBOM, MARC, one of a numerous German family, distinguished in the 17th century for their classical knowledge and scientific attainments. He was born at Tonningen, in the duchy of Schleswig, about 1630, and died at Utrecht about 1711. In 1674 he came to England, where he prepared a new edition of the Hebrew Bible. A list of his published works is given in the 'Biographie Universelle.'

MEININGEN. [Saxe-Meiningen.]

MEISSEN, a town in the kingdom of Saxony, situated about 18 miles N.W. from Dresden, on the left bank of the Elbe, over which there is a covered bridge, is the capital of the circle of Meissen, and has about 7800 inhabitants. The cathedral, the palace of Albrechtsburg, formerly the residence of the Margraves of Meissen, and now a porcelain manufactory, and the former convent of St. Afra, are the chief buildings. The chief manufactures are porcelain, hats, cards, &c., but the principal source of profit is the making of wine.

MEISSENHEIM. [Hesse-Homburg.]

MEJERDA, or BA'GRADAS, is a river of Africa, which in its upper course lies within the territories of Algiers; in its middle course it forms the boundary line between that country and Tunis; and in its lower course it traverses the northern district of the last-mentioned state. The principal feeder of this river is the Wady Serat, which drains the eastern slopes of the Atlas range. Up to its junction with the Wady Hamiz, which flows into it from the west, its course exceeds 100 miles, and from this point it runs about

60 miles E. through a hilly country. It then turns N.N.E., and continues this course until it falls into an inlet of the bay of Tunis, after a course of more than 260 miles. The Mejerda does not appear to be navigated, but it is used to irrigate the fields in the lower part of its course, where it flows through a wide and level valley. It overflows in the spring, and fertilises the adjacent country.

MEKRAN. [PERSIA.]

MELA, POMPO'NIUS, a Roman writer on geography, who was probably contemporary with the Emperor Claudius.

Mela's work is entitled in most MSS. 'De Situ Orbis.' It is divided into three books, and contains a very brief description of the various parts of the world. The best editions of Mela are by Gronovius, Leyden, 1685, frequently reprinted; by Tzschucke, 7 vols. 8vo., Leip., 1807; and the Bipont, 1809. Mela has been translated into English, by Arthur Golding, Lond., 1585 and 1590; into Italian, by Porcacchi, Ven., 1557; and into French, by Fradin, 3 vols. 8vo., Paris, 1804.

MELAIN, the colouring matter of the ink of the Cuttle-Fish. It constitutes about three-fourths of the ink when dried by evaporation.

MELALEUCA, a genus of plants belonging to the natural order *Myrtaceæ*.

M. Cajuputi is the species which yields the chief part of the oil brought to Europe under the name of Cajeput Oil. It is a native of Amboyna and other East India Islands. The oil is obtained by distillation of the leaves and branches, which are collected the night before they are subjected to this process. It is very limpid, pellucid, and of a light or yellowish green colour. In its action on the human frame Cajeput Oil participates in the properties of other volatile oils, and is rubefacient externally; stimulant, and antispasmodic, when taken internally.

M. leucodendron, the White Tree, or Cajeput Tree, is a native of the East India Islands, and was at one time supposed to yield the oil of commerce. Roxburgh asserts that it possesses little or no fragrance in its leaves, and that it is seldom or never used for the distillation of the oil which is used in the European markets.

Upwards of thirty species of Melaleuca have been described, the majority of which are natives of New Holland. Many of them are fine plants with beautiful blossoms, and very desirable for the conservatory or greenhouse.

MELAMPY'RUM, a genus of plants belonging to the natural order *Scrophulariaceæ*. Eight species are enumerated by Don, six of which are European and two American. Of the six European four are natives of Great Britain. *M. cristatum*, Crested Cow-Wheat, is a native of woods and thickets in the eastern counties of England, and also generally of the north and middle of Europe. *M. arvense*, Purple Cow-Wheat, is a native in fields of wheat in the south of Europe, and is found in Great Britain, though only rarely, in Norfolk and the Isle of Wight.

MELANCHTHON, PHILIP (or MELANTHON, as he himself was most accustomed to write the name), was born in the small town of Bretheim, in the Palatinate of the Rhine, or Lower Palatinate, as it used to be called, the dominion of the elector palatine. His father was George Schwarzerde, or Schwarzerdt. On the death of his father, he was sent to the college of Pfortsheim, where he lodged in the house of a sister of the celebrated Greek scholar John Reuchlin, who was his relation, and it was from Reuchlin, who had translated his own Teutonic surname into the Greek formation Capnio, on the supposition of its connection with Rauch (smoke), that the young Schwarzerde, a compound, meaning, in English, 'black earth,' received the more melodious Grecised appellation of Melanchthon, by which alone he is now known.

After spending about two years at Pfortsheim, Melanchthon went to the university of Heidelberg, and thence to Tübingen, where he remained till, on the recommendation of his friend Reuchlin, he was in 1518 appointed, by the elector Frederic of Saxony, professor of Greek in the newly established university of Wittenberg. This situation he held as long as he lived. At Wittenberg Melanchthon became acquainted with Luther, then occupying the chair of theology in that university; and his name is henceforth associated with that of Luther in the history of the Reformation. The remainder of his biography is chiefly the detail of his various labours in the promotion of the reformation. In 1519 he accompanied Luther to Leipzig, to hold a disputation on the divine original of the papal authority, with Eckius, one of the ablest of the Catholic champions of that age. For some years after this he was actively employed, not only in writing books in defence of the reformed doctrines, but in founding schools and colleges, in visiting churches, and in other services of the same kind, undertaken at the command of the elector.

In 1530 he was appointed by the general body of the reformers to draw up what was intended to be the conciliatory Confession, or exposition of their opinions, which was presented to the emperor at the diet held at Augsburg in March that year. After the death of Luther, Melanchthon became involved in a bitter controversy with the more ardent spirits of his party, in consequence of his aversion to extreme courses, and especially the timidity he was accused of showing in his approval of the system of compromise between the two religions issued by the emperor in 1548, and afterwards known by the name of the Interim, an approval in which he stood nearly alone among the distinguished men of both sides. He died at Wittenberg, 19th April, 1560, leaving two sons and two daughters by his wife, the daughter of a burgomaster of that town, whom he had married in 1520. His numerous works, consisting of theological treatises, commentaries on several of the Greek and Latin classics, Latin poems, and some historical and philosophical writings, were published in a collected form in five vols. fol., at Basel, in 1544, and in four vols. fol., at Wittenberg, in 1564, again in 1580, and again in 1601.

MELANIANS, Lamarck's name for a family of fluviatile, testaceous, operculated Mollusks,

breathing water only, and belonging to the order *Trachelipoda*. The family consists of the genera *Melania*, *Melanopsis*, and *Pirena*, according to Lamarck; and Mr. G. B. Sowerby, jun. ('Conchological Manual'), suggests that to these may be added *Anculosa* and *Pasithœa*. M. Deshayes, in the last edition of Lamarck, adds the genera *Eulima* and *Rissoa* to *Melania*, *Melanopsis*, and *Pirena*, the latter of which, it seems, should be expunged.

MELANORRHŒA, a genus of the natural family of *Terebinthaceæ*, tribe *Anacardiaceæ*. *Melanorrhœa usitata* is familiarly known as the Birmese Varnish Tree. The tribe to which it belongs, abounds in plants yielding a blackish, acrid, and resinous juice, used for varnishing and similar purposes, as the Marking Nut and the Japan Varnish Tree.

The Varnish Tree, or Theetsee, forms a large tree, with the habit of *Semecarpus*, and abounds in every part with a viscid ferruginous juice, which quickly becomes black by the contact of the atmosphere. The varnish is collected by inserting pointed joints of bamboo, which are closed at the other end, into wounds made in the trunk and principal boughs. The joints of bamboo are removed after from twenty-four to forty-eight hours, and their contents, which rarely exceed a quarter of an ounce, emptied into a basket made of bamboo and rattan previously varnished over. In Birma, almost every article of household furniture intended to contain either solid or liquid food is lacquered by means of this varnish. It is also much employed in the process of gilding: the surface, being first besmeared with this varnish, has then the gold leaf immediately applied to it. The beautiful Pali writing of the Birmese, on ivory, palm-leaves, or metal, is entirely done with this varnish in its native and pure state.

MELANO'SIS is a malignant disease distinguished by the deposition of a peculiar soft morbid substance, of which the most prominent character is a deep brown or black colour. The deposition of melanotic matter generally takes place successively in numerous parts of the body, producing in all the injurious effects of compression and irritation, till it proves fatal either by its direct influence on some important organ, or by the exhaustion which it gradually induces.

MELANTHA'CEÆ are a natural order of poisonous Endogens, very nearly related to *Liliaceæ*. The most important species of the order are medical plants, viz. *Colchicum*, or Meadow Saffron, which is employed as a remedy for gout and rheumatism; *Veratrum album*, whose acrid poisonous rhizoma is White Hellebore; *Asagræa officinalis* and *Veratrum sabadilla*, both of which furnish the seeds called Cebadilla, now largely consumed in the preparation of Veratria; and a few North American plants of less moment.

MELA'STOMA, a genus of plants, the type of the natural order *Melastomaceæ*. The species of this genus are shrubs. The flowers are large, white, rose-coloured, or purple. *M. Malabathricum*, Malabar Melastoma, is a native of the East Indies, and frequent in the Indian Archipelago. The leaves of this plant are employed by the natives, where it grows, as a remedy in diarrhœa, dysentery, and mucous discharges.

MELASTOMA'CEÆ, an extensive natural order of polypetalous Exogens, nearly related to *Myrtaceæ*. The species are extremely numerous in tropical countries, where they usually form bushes or small trees, and are scarcely known beyond the tropics, with the exception of some *Rhexias*, which straggle into North America. In Europe the order is unknown, unless in gardens, where many species are cultivated for the sake of their gay purple or white flowers.

MELAZZO. [MESSINA.]

MELBOURNE, WILLIAM LAMB, VISCOUNT, was born March 15, 1779. His father, Peniston Lamb, of Brocket Hall, Hertfordshire, was raised to the peerage of Ireland in 1770, by the title of Lord Melbourne, baron of Kilmore, created an Irish viscount in 1781, and finally elevated to the peerage of the United Kingdom in 1815, as Baron Melbourne, in the county of Derby.

The subject of this notice entered as a student at Lincoln's Inn, July 21, 1797, and was called to the bar Nov. 23, 1804. In 1805 he married Lady Caroline Ponsonby (daughter of the Earl of Bessborough) from whom he was afterwards separated. She was well known for her literary talents as Lady Caroline Lamb. In the same year the Hon. William Lamb entered parliament as member for Leominster, and joined the Whig party, then headed by Fox.

During many years of the long and chequered administration of Percival and Liverpool, Mr. Lamb continued in a course of moderate opposition, occasionally supporting the measures of government. He sat in parliament for several different places; during the latter part of the time for the county of Hertford. On the accession of Canning to office (1827) he was made secretary for Ireland. Under Lord Goderich's public administration Mr. Lamb retained his office, and continued to serve with that of the Duke of Wellington, until the resignation of Mr. Huskisson, in 1828, induced him also to resign. The death of his father, a few weeks afterwards, occasioned his removal to the House of Lords.

The prominent portion of Lord Melbourne's life commenced in 1830 with the Grey administration, when his lordship was appointed Secretary of State for the home department.

Lord Grey resigned early in July, 1834, and on the 14th of the same month Lord Melbourne announced that he had been appointed Premier, and empowered to reconstruct the administration. In the following November the death of Earl Spencer, father of the then Lord Althorp, caused the removal of his lordship to the house of peers, and he resigned the office of Chancellor of the Exchequer. The king intimated to Lord Melbourne that he considered the retirement of Lord Althorp as equivalent to a breaking up of the ministry. There was therefore but one course to pursue, and the Duke of Wellington and Sir Robert Peel immediately came into power.

On the meeting of the new parliament in Feb., 1835, Lord Melbourne, in the upper house, moved

an amendment to the address, in which he made their lordships express a hope that his Majesty's councils would be conducted in a spirit of well considered reform; and to lament the dissolution of the late parliament, as having interrupted and endangered the vigorous prosecution of measures to which the wishes of the people were directed. The proposed amendment however was eventually withdrawn. After a few months of adverse votes, the Irish tithe question drove the ministry from office, and Lord Melbourne was reinstated as first Lord of the Treasury. The new premier lost no time in forming a decidedly liberal cabinet; and from April, 1835, to September, 1841, the Whig government effected some very beneficial reforms. During this period (June 22, 1836) a special jury, empanelled to try an action for criminal conversation, in which the Hon. George Norton was the plaintiff and Lord Melbourne the defendant, delivered a verdict in his lordship's favour. After his resignation Lord Melbourne led a life of retirement, which he ended, Nov. 24, 1848, after a short illness.

MELCOMBE REGIS. [DORSETSHIRE.]

MELDRUM, OLD. [ABERDEENSHIRE.]

MELFI. [BASILICATA.]

MELI, GIOVANNI, was born at Palermo, in Sicily, about 1740. He is known for his poetical compositions in the vernacular dialect of Sicily, which have earned him the name of the modern Theocritus. His pastoral poems are equal, if not superior, to any compositions of the same kind which Italy has ever produced. He excelled particularly in his 'Ecloghe Pescatorie,' or fisherman's dialogues, in which he has borrowed the peculiar language and humour of that class of people. Meli also wrote a mock heroic poem, under the title of 'Don Chisciotti' (Don Quixote), in twelve cantos, which is a sort of imitation of Cervantes' celebrated novel. His collected works were published at Palermo in 1814, soon after which he died.

ME'LIA, a genus of plants belonging to the natural family *Meliaceæ*, to which it has given its name. The species are few, and chiefly Indian; one is naturalised in the south of Europe, and one is found in North America. *Melia-Azadirachta* is bitter, and considered a valuable tonic. *Melia Azedarak*, the Pride of India, or Common Bread-Tree, is a native of China and the North of India. It is much cultivated in the southern United States of North America. Its flowers resemble those of the lilac, and are very fragrant.

MELIA'CEÆ, a natural order of polypetalous Exogens, consisting of trees or shrubs, inhabiting all countries within the tropics, but very rare in colder climates; the *Melia-Azedarak*, or Bread-Tree, a Syrian plant, now naturalised in the south of Europe, forming the principal exception. In general the species are bitter and astringent, but they are sometimes dangerously poisonous, acting violently as emetics and purgatives.

ME'LICA, a genus of plants belonging to the family of Grasses. There are two British species of this genus, *M. uniflora* and *M. nutans*, which are found in damp shady woods.

MELILOT. [MELILOTUS.]

MELILO'TUS, a genus of plants belonging to the natural order *Leguminosæ*. None of the species are ornamental plants, and they are seldom cultivated except in botanical collections. Two species are found native in Great Britain. *M. officinalis* has long roots, and a branching stem two or three feet high. It grows wild in woods, hedges, and neglected fields. When cultivated in a dry soil and made into hay, it has a powerful aromatic smell, and mixed in a small proportion with meadow-hay, gives it an agreeable flavour. *M. vulgaris* is a rare plant, and is found in sandy and gravelly places near the sea.

MELIPHA'GIDÆ (Honey-Eaters), a family of Tenuirostral birds. [TENUIROSTRES.]

Mr. Vigors, in his paper 'On the Natural Affinities that connect the Orders and Families of Birds' ('Linn. Trans.,' vol. xv.), thus generally refers to the *Meliphagidæ*. 'That extraordinary group, the existence of the much more considerable portion of which was unknown to the Swedish naturalist, for which there was consequently no place in his system, occupies a prominent and important situation in the ornithological department of nature. Chiefly confined to Australasia, where they abound in every variety of form, and in an apparently inexhaustible multitude of species, they find a sufficient and never-failing support in the luxuriant vegetation of that country. There the fields are never without blossom, and some different species of plants, particularly the species of *Eucalyptus*, afford a constant succession of that food which is suited to the tubular and brush-like structure of the tongue in these birds. Their numbers and variety seem in consequence to be almost unlimited.'

Mr. Gould, in his splendid work on the 'Birds of Australia,' figures and describes 58 species, exclusive of some few which are found in New Guinea and some of the Polynesian Islands. Mr. Gould admits the following genera. *Meliphaga, Glyciphila, Ptilotis, Plectorhyncha, Xanthomyza, Melicophila, Entomophila, Acanthogenys, Anthochæra, Tropidorhynchus, Acanthorhynchus, Myzomela, Entomyza, Melithreptus,* and *Myazantha.*

MELISSA, a genus of plants belonging to the natural order *Labiatæ* or *Lamiaceæ*. In its recent state it has a rough aromatic taste and a pleasant lemon-like smell. It is frequently used in infusion, under the name of Balm Tea, as a common drink in fevers. It was one of the medicines recommended by Paracelsus, but at the present day it is only used as a popular remedy.

ME'LITA, Dr. Leach's name for a genus of Amphipodous crustaceans, generally found beneath stones on the sea-shores. Example, *Melita palmata, Cancer palmatus,* Montagu. Colour, blackish. Antennæ and feet annulated with palish gray.

ME'LITO, SAINT, was bishop of the church at Sardis in Lydia, in the second century. During the persecution of the Christians in the reign of Marcus Antoninus, he wrote an apology for them, and he died and was buried at Sardis before the end of the second century. Eusebius and Jerome have given lists of Melito's works, of

which the most important is a 'Catalogue of all the Books of the Old Testament which are universally acknowledged.'

MELLAN, CLAUDE, was born at Abbeville, in 1601. He studied in Rome under the then celebrated Vouet, but he soon gave up painting for engraving. He did not altogether adopt his own peculiar method of engraving by a single line, until his return to France. He latterly executed all his plates by single lines. Mellan carried this peculiarity to a great extreme on one occasion; he engraved a Sancta Veronica, or the Face of Christ, as large as life, by a single spiral line, commencing at the end of the nose; the execution is beautiful, and it is an extraordinary monument of patience and perseverance. Mellan's prints amount, according to some accounts, to upwards of 500; many of them are after his own designs. He enjoyed a great reputation during his lifetime. Charles II. invited him to England, and Louis XIV. granted him an annual pension, and gave him apartments in the Louvre. He died at Paris in 1688.

MELLITE, *Honey-Stone*, occurs nodular, granular, and crystallized. The crystals are translucent, and of a honey yellow colour. It consists of mellitic acid, alumina, and water.

Mellitic Acid has a sour bitter taste, is very soluble in water, and also in alcohol, and it crystallizes in colourless needle-form crystals. It consists of O^4 H^1 C^4.

MELLON, a compound which, like cyanogen, consisting of the same elements in different proportions, is considered as a compound radical. Mellon has a yellow colour; is insoluble in water, alcohol, dilute hydrochloric or sulphuric acids. By particular treatment there may be produced from it *hydromellonic acid*, a dirty white gelatinous substance, which becomes yellow on drying. Mellon consists of N^4 C^6, and this, with H^1, gives hydromellonic acid.

MELMOTH, WILLIAM, bencher of Lincoln's Inn, London, born in 1666, died in 1743. The work by which his name is known is 'The great Importance of a Religious Life.' Nichols mentions, that since the death of Melmoth to his time, above 100,000 copies of this work had been sold.

MELMOTH, WILLIAM, son of the above, born in 1710, died in 1799. He was a commissioner of bankrupts, but is chiefly known as an accomplished scholar. His translations of the Epistles of Pliny, those of Cicero to his friends, and the treatises on Old Age and Friendship, are well-known. He was the writer of 'FitzOsborne's Letters, containing dissertations both moral and literary.' He wrote a treatise on the Christian Religion, and Memoirs of his father.

MELODY. [AIR.]

ME'LOE. The Linnæan genus *Meloe* included the several genera of heteromerous Coleoptera now forming the family *Cantharidæ*, interesting on account of its including those beetles known under the name of 'blistering flies,' and employed in medicine. The term *meloe* is now restricted to the apterous *Cantharidæ*, and the species are all beetles with large and swollen bodies, and short oval elytra, lapping over each other at the base of the suture. They are sluggish creatures, and feed on various plants, especially the species of ranunculus. When alarmed they emit from the articulations of their legs an oily yellow or reddish liquid.

MELOLO'NTHIDÆ, a family of Coleopterous insects of the section *Lamellicornes*, and subsection *Phyllophagi*. This family, of which the common Cockchafer (*Melolontha vulgaris*) is an example, consists of three genera: *Melolontha*, *Rhizotrogus*, and *Serica*, and some subgenera of minor importance. Species of this family are found in all parts of the world. In the genus Melolontha the antennæ are ten-jointed; the terminal five, six, or seven joints are lamellated, and form a large fan-like appendage; in the females the lamellated joints form a smaller club than in the males, owing to their smaller size, and also to a decrease in their number, there being six, five, or four; the labrum is deeply cleft on its lower margin; the claws of the tarsi are furnished with a spine on the under side near the base; the abdomen in the male sex often terminates in a horny pointed process.

Two species of this genus are found in England, the common Cockchafer (*Melolontha vulgaris*, Fab.), and the *Melolontha fullo*, a large species nearly an inch and a half in length, and which is of a blackish-brown colour, with irregular white markings. This beautiful insect is common in some parts of the Continent, but rare in this country, and has been found chiefly in the neighbourhood of Deal.

MELON is an herbaceous, succulent, climbing or trailing annual, cultivated for its fruit in hot eastern countries from time immemorial. In regions where most cooling vegetables disappear on the approach of great summer heat and drought, the melon, together with the water melon, become essential substitutes. The antiquity of the cultivation of melons being so remote and their dispersion over large portions of Asia and Africa so extensive, their indigenous locality cannot be traced at the present day.

If the roots be favourably situated, so far as moisture is concerned, the melon will bear tropical heat; and, generally speaking, it will not succeed perfectly in the open air beyond the 43rd parallel of latitude. Its range of atmospheric temperature may be estimated at between 70° and 80°.

Light is so essential, that unless the plant are kept near the glass, no tolerable degree of flavour will be acquired. As much of the direct rays of the sun should be admitted as the plant will endure, more especially when the fruit is approaching maturity. A free admission of the air is also to be recommended, so far as is consistent with the maintenance of a high temperature. The regulation of moisture in the artificial atmosphere in which melons are grown under an English sky is, of all others, the greatest difficulty. Covering the soil with slates or tiles, or with clean gravel has been successfully resorted to as a mode of preventing the air in the frame from being at all times saturated with moisture exhaled from the soil.

MELOS. [MILO.]

MELPO'MENE. [MUSES.]

MELROSE. [ROXBURGHSHIRE.]

MELTON MOWBRAY. [LEICESTERSHIRE.]

MELUN, the ancient *Melodunum*, capital of the French department of Seine-et-Marne, is situated on the Seine in 48° 32′ 32″ N. lat., 2° 29′ 10″ E. long., 24 miles S.S.E. from Paris, and has a tribunal of first instance, a college, and 8950 inhabitants. The town is built on an island (the site of Melodunum) and on both banks of the river, the largest quarter standing on a slope on the right bank, and the three parts being united by two bridges. It is on the whole a well built town; the banks of the river are lined with quays, and several new promenades have been formed. The principal square, which is regularly built; the church of St.-Aspais, on the right bank of the Seine; the church of Notre-Dame, on the island; the monastery of St.-Père, now the residence of the Prefect; the Carmelite convent, now converted into a court-house, a prison, a guard-house, and theatre; the old monastery of La-Maison-des-Frères, which now serves for a cavalry barrack; and the central prison for five departments, are the chief structures in the town. The manufactures are woollen stuffs, printed calicoes, cotton twist, and leather. Melun has a good trade in corn, flour, wool, and cattle. The Paris-Dijon Railroad, now open to Tonnerre, passes through Melun.

MELVILLE, ANDREW, was born August 1, 1545. He was the youngest of nine sons, children of Richard Melville of Baldovy, an estate near Montrose, in Scotland. At the age of fourteen, he was removed from the grammar-school of Montrose, to St. Mary's College, in the university of St. Andrews. This place he left in 1564, with considerable reputation for his proficiency in philosophy and the languages, and repaired to the Continent. His great proficiency in philosophy obtained for him successively the place of regent in the college of St. Marceon, France, and the chair of humanity in the academy of Geneva, which place he reached on foot, and in a state of destitution. After a residence abroad of two years, he returned to England, and published his poetical paraphrase of the 'Song of Moses,' and a chapter of the Book of Job, in Latin.

Shortly after Melville's arrival in Edinburgh, in July 1574, he was appointed by the General Assembly Principal of Glasgow College. He introduced improvements in teaching and discipline of great importance, and infused an uncommon ardour into his pupils. It was not however as a mere scholar or academician that Melville was distinguished. He was active in the church courts and in the conferences held with the parliament and privy-council on the then much agitated subject of church government. To him is generally ascribed the overthrow of episcopacy at that time and the establishment of presbytery, and he commonly went afterwards by the name of Episcopomastix, or the Scourge of bishops.

In the reformation and improvement of the universities, Melville also took a leading part. At the end of the year 1580 he was translated from Glasgow to be principal of St. Mary's College in the university of St. Andrews, where he distinguished himself by his usual zeal and ability. In these scholastic labours he did not lose sight of the condition of the Church, and being called on to open an extraordinary meeting of the General Assembly in 1582, he inveighed in his sermon in strong terms against the arbitrary and oppressive measures of the court. For this he was cited before the privy-council for high-treason. The charge was not proved; but the privy-council found him guilty of behaving irreverently before them, and sentenced him to imprisonment. Fearing his death was ultimately intended, he was urged by his friends to make his escape, and accordingly leaving Edinburgh he went to London, where he remained till about the end of 1585, when Arran having been driven from court, Melville returned to Scotland, and resumed his former station in the university. In May, 1606, after the king had ascended the English throne, Melville was desired by his majesty to repair to London that his majesty might consult him on ecclesiastical matters. Melville had various interviews with the king; but having written a Latin epigram, in which he expressed his feelings of indignation at some rites of the English church on the festival of St. Michael, he was summoned before the privy-council, found guilty of *scandalum magnatum*, and imprisoned in various places till February 1611, a period of about four years, when, at the solicitation of the Duke of Bouillon, who wished his services as a professor in the university of Sedan, he was permitted to depart the kingdom. In 1620 his health, which had previously been slightly impaired, grew worse, and in the course of the year 1622 he died at Sedan. His life has been written by Dr. M'Crie, 2 vols. 8vo., 1819.

MELVILLE ISLAND is situated on the northern coast of Australia, between 11° and 12° S. lat., and 130° 20′ and 131° 34′ E. long. It is separated from Bathurst Island, which lies east of it, by Apsley Strait, 46 miles long by 3 broad. East of the island lies Coburg Peninsula, where a British colony was established some years ago [ESSINGTON, PORT], and between them lies Dundas Strait, 15 miles wide. The eastern end of Melville Island is only 15 miles from the mainland of Australia. The northern line of coast, and also the western, along Apsley Strait, are low, intersected by swamps, and covered by impenetrable woods of mangroves. The interior is more elevated, and has an undulating surface. The island is well clothed with wood, and presents one mass of thick green foliage. Water is easily obtained by sinking wells. The natural vegetation is luxuriant, but the soil is not generally good for farming. The zoology of the island is very varied. The native inhabitants are of the Australian stock, but somewhat more intelligent.

ME'LYRIS, a genus of Coleopterous insects established by Fabricius, for the reception of certain species of the Linnæan genera *Cantharis* and *Dermestes*. It belongs to the family *Serricornes* of Latreille, and constitutes the type of the family *Melyridæ*. The *Melyridæ* are active

and often gaily coloured little beetles, usually found on flowers, which they frequent for the purpose of preying on other insects. The larvæ, as well as the perfect insects, are carnivorous. The family is intermediate between the *Telephoridæ* and *Cleridæ*.

MEMBRANE (in Anatomy) is an expansion of any tissue in a thin and wide layer. It is of three kinds, the serous, the mucous, and the fibrous, which are distinguished as well by their physical characters and their functions as by the diseases to which each is peculiarly subject.

The *serous membranes* are so named from the character of their secretion, which consists of a very small quantity of thin serous fluid. In the adult condition of man and the higher vertebrata, they form what are called shut sacs. It is the general condition of serous membranes, that they exist, with the single exception of the conjunctiva of the eye, wherever there is friction between the surface of an organ and the cavity in which it is contained. They are adapted for this condition by possessing a remarkably smooth polished surface, covered by a very fine layer of epithelium, through which their moistening secretion can easily pass. The serous membranes in man are, the arachnoid, which is found in the cerebro-spinal cavity, lining the dura mater, and covering the brain and spinal chord, and lining the ventricles; the pleuræ, lining the chest and covering the lungs; the pericardial serous membrane, similarly related to the heart and its investing sac; the peritoneum, lining the abdominal walls and covering the abdominal part of the digestive canal, the liver, spleen, part of the pancreas, &c.; and the tunica vaginalis, forming the sac of the testis. The synovial membranes, by which joints are lined, and the heads of bones which move on each other covered, may be regarded as a modification of serous membranes. A membrane very similar to the serous lines the whole vascular system, and forms the internal membrane of the arteries, veins, lymphatics, and lacteals.

The *mucous membranes*, like the serous, are named from their peculiar secretion. [Mucus.] While the serous membranes line all those cavities whose surfaces are in contact with living parts, the mucous membranes line those canals and cavities which, in the adult condition of man and the higher vertebrata, are exposed to the contact of the air and other inorganic substances. In the parts where they line the organs of sense, the mucous membranes are generally beset with fine nervous papillæ; in other parts, numerous glands for peculiar secretions open on their surface by orifices through which the membrane is continued up the branches of the ducts into the very substance of the gland.

The *fibrous membranes* are those which are chiefly formed of tendinous tissue. They serve either to form strong cavities for the protection of important parts, as the pericardium, the dura mater, the fibrous capsules of joints, the sheaths of tendons, &c., or to envelop and strengthen certain parts, as the periosteum, fasciæ, &c.; or they are merely expanded tendons, as aponeuroses. They are tough and inelastic membranes, composed of the shining dense wavy fibres which constitute the usual structure of tendons, mixed with more or less of a dense cellular gelatinous tissue.

MEMECYLA'CEÆ are a very small natural order of Polypetalous Exogens, consisting of a few tropical plants of little interest. Most of them inhabit the East Indies, the Isle of France, and Madagascar. No useful properties have been assigned to any of the species, except to *Memecylon edule*, an East Indian plant, whose leaves are an ingredient in the dyes of Coromandel, according to Roxburgh, and whose ripe, astringent, pulpy black berries are eaten by the natives.

MEMEL. [Königsberg; Niemen.]

MEMLING, HANS, or JAN, was born, probably about 1439, at or near Constanz. It has been the subject of some dispute whether his name was *Hemling* or *Hemmelinck*, or *Memling* or *Memmelinck*, but Memling appears to be the correct spelling. Memling lived four years in Spain; and he is also said to have served Charles the Bold, Duke of Burgundy, both as painter and warrior. The story runs, that he was at the battles of Granson and Morat in 1476, and was admitted ill and wounded into the Hospital of St.-John at Bruges, when, during his illness, he painted the beautiful pictures which still adorn its walls. The principal of these works are—St.-Ursula and her Companions, the Adoration of the Magi, and the splendid altar-piece of the Marriage of St. Catherine. There are pictures ascribed to Memling at the Hague, at Antwerp, at Louvain, at Berlin, and at Munich. The date of Memling's death is uncertain, but it probably took place in Spain between 1499 and 1506.

MEMMI, SIMONE, or *Simone di Martino*, was a very celebrated Italian painter of the 14th century. He was born at Siena in 1284, or, according to Vasari, in 1285. He was the rival of Giotto. Simone now owes his fame chiefly to Petrarch: they were both living at the same time at Avignon during the residence of the popes there, and Simone painted the portrait of the celebrated Madonna Laura for the poet, who wrote two sonnets on the painter. Few of Memmi's works now remain, and these are dry and meagre performances. The principal are the frescoes of the chapel degli Spagnuoli at Florence.

Simone painted also in miniature. There is a MS. of Virgil, now in the Ambrosian Library at Milan, but formerly in the possession of Petrarch, which is preceded by a miniature of Virgil seated with his pen in his hand, invoking the poetic muse. Memmi died at Avignon in 1344.

Lippo Memmi, the brother-in-law of Simone, assisted Simone in some of his works, and completed others which were left unfinished at his death. He was not equal to Simone.

MEMNON, a personage frequently mentioned by Greek writers. The majority of them trace his origin to Egypt or Ethiopia in Africa. The partial deciphering of the Egyptian proper names affords sufficient reason for believing, with Pausanias (i. 42, s. 2), that the Memnon of the Greeks may be identified with the Egyptian Phamenoph, Phamenoth, Amenophis, or Amenothph; of which name the Greek is probably only a corruption.

There are many colossal statues in Egypt, which have been called Memnonian, of which the most celebrated is the vocal statue described by Strabo and Pausanias. At sunrise a sound was said to proceed from this statue, which Pausanias compares to the snapping of a harp or lute string (i. 42, s. 3). Strabo states that he heard the sound himself, in company with Ælius Gallus (p. 816); and Tacitus relates that Germanicus also heard the sound. ('Ann.' ii. 61.) This statue is identified, by the descriptions of Strabo and Pausanias, with the northernmost of the two colossal statues in the Theban plain, on the west bank of the Nile. Its height, according to modern travellers, is about 50 feet.

(*Library of Entertaining Knowledge; Egyptian Antiquities.*)

MEMNON, a Greek historian of Heracléa in Bithynia, lived in the first or second century of the Christian æra. He wrote a history of the tyrants of his native town, of which considerable extracts have been preserved by Photius; these extracts have also been published separately. The best edition is by Orelli, Leip., 1816.

MEMOIRS. According to the original use of the word by the French, from whom we have derived it, Memoirs signify a narrative or account mainly intended for no higher purpose than that of simply recording the facts which it embraces, or preserving the 'memory' of them. A common description of French works of this kind is *Mémoires pour servir* (i. e. *à l'Histoire*). Most frequently too, but not universally, Memoirs detail events in which the writer himself has been personally concerned. Very often the work is purely biographical, and not historical at all; and sometimes materials for biography only, and not a biographical work in the proper sense of the term. There are also other uses of the term, as when we speak of the Memoirs of academies or scientific bodies. The French language is particularly rich in those historical and biographical materials which are expressed by the term *Mémoires*.

MEMORY is a name given to one of what are called the faculties of the mind—the faculty of remembering or recollecting. The word is used to denote at the same time the operation or act of remembering and the state of the mind when it exercises the faculty, as distinguished from the faculty itself, but this last is a derived and by far the rarer use of the word.

When an idea is reproduced in the mind by any of the ordinary modes of association, and there co-exists with this idea the idea of its having been before present in the mind, this complex state of mind is a case of memory. We are then said to remember the thing, the idea of which is thus present to the mind. This is an exercise of the faculty of memory.

There is a distinction between *remembering* and *recollecting*, which it is worth while to notice. The ideas that are remembered either come into the mind without any effort on the part of the person remembering, or with such effort. In the first case the person is more properly said to remember; in the second, to recollect. The effort of recollection may be generally described as consisting in seeking out for different ideas which are likely to recall, by any of the ordinary modes of association, the desired idea. What these modes of association are has already been explained in the article Association.

MEMPHIS, an ancient city of Egypt, once the rival of Thebes in magnitude and splendour, was situated on the western bank of the Nile, about 10 miles S. from Jizeh, on the site of the present village of Metrahenny. There are still considerable remains scattered over an extensive space, though it has for hundreds of years been used as a stone quarry by the successive conquerors of the country.

MENA, JUAN, the best Castilian poet of the 15th century, was born about 1412, at Cordova. Juan II. appointed Mena his Latin secretary, and, what is more, his historiographer, a most honourable office, which was instituted by Alphonso X. A fatal pleurisy stopped Mena's career in 1456 at Torrelazuna, where his friend the Marquis of Santillana erected a sumptuous monument to his memory. Mena's chief performance, 'El Laberinto,' or 'Las Trescientas (coplas),' is a didactic moral poem of the allegorical kind. Mena wrote some fugitive pieces; 'La Coronacion,' in honour of Santillana, and part of another moral allegory, 'Tratado de Vicios y Virtudes.' He also wrote 'La Cronica de Juan II.,' from 1420 to 1435. Some inedited memoirs on noble families of Castile ('Libro de Linages'), and a portion of the Iliad in Spanish, still in MS., are properly attributed to him.

MENAGE, GILLES, was born at Angers, Aug. 23, 1613. Ménage began life as an advocate at Paris; but, finding this profession not to suit his taste, he got himself made an abbé. He then resided for a time in the family of Cardinal de Retz; but he finally established himself in a house of his own in the cloister of Notre Dame, which soon became celebrated for the assemblies of men of letters, whom he continued to gather around him every Wednesday evening to the end of his long life. Of his numerous works the following are the most important:—'Origines de la Langue Française;' 'Poemata Latina, Gallica, Græca, et Italica;' 'Observations sur la Langue Française;' 'Origini della Lingua Italiana;' 'Anti-Baillet;' a valuable edition of Diogenes Laertius, with annotations; and some other editions of classical and other works. After his death in 1692, his friends published, under the title of 'Ménagiana,' a collection of his bon-mots and other remarks made in conversation.

MENAI STRAIT. This narrow channel, about 17 miles in length, which separates the island of Anglesey from the mainland of Wales, intervenes on the great mail-route from England, by way of Holyhead, to the eastern coast of Ireland. It is crossed by a suspension bridge, of which the first stone was laid Aug. 10, 1819, and the mail-coaches drove over it for the first time Jan. 30, 1826. The Menai Bridge was planned and executed by Telford. The distance between the supporting pyramids or points of suspension is 560 feet, and the height of the carriage

way above high water in the Strait is 100 feet. The roadway of the bridge is divided into two carriage ways, each 12 feet wide, with a footpath 4 feet wide between them.

The Menai Strait will probably in about a year from this time (that is, some time in the summer of 1850) be the site of a work of engineering skill still greater than that of the Menai Bridge. The Britannia Bridge, now in progress of construction by Robert Stephenson, is to be a tubular bridge, similar to that which he has already constructed across the river Conway, which is 400 feet in length, and through which the trains of the Chester and Holyhead Railway passed for the first time May 1, 1848. The Britannia Bridge will consist of two tubes of iron placed side by side, through which the up and down trains of the Chester and Holyhead Railway will respectively pass. The entire length of each tube will be 1516 feet, and the height above high water will be 102 feet. Each tube will consist of four pieces, the ends of which will rest and be joined together on a central pier built on the Britannia Rock in the middle of the Menai Strait, two towers on the shores of Anglesey and Caernarvonshire respectively, and two abutments farther inland on each coast. There will therefore be eight tubes in all. The clear length of each tube reaching from the side-towers to the central tower will be 460 feet, so that the entire length of tube across the Strait will be 920 feet, leaving 593 feet for the entire length of the side tubes. The top of each tube forms a regular arch; the bottom is quite straight and horizontal. The interior height is 26 feet in the centre, and 18 feet 9 inches at the ends. The internal width is 14 feet from side to side. The tubes are formed of plates of wrought iron strongly riveted together. The weight of each tube will be about 5000 tons, or 10,000 tons for the whole of the double tube of iron.

Holyhead, at which the railway will terminate, is a market-town with a good harbour, and is situated on the northern coast of Holyhead Island, which lies to the west of the island of Anglesey, and from which it is separated by a sandy and shallow strait. Across this strait the Holyhead road is carried by a long embankment or causeway, in the centre of which is an opening arched over for the tide to pass through. Holyhead harbour is formed by a pier faced with hewn limestone 900 feet in length, at the head of which the water is 14 feet deep at low tides. Holyhead is a parliamentary borough, contributory to the Beaumaris district, and contained in 1841 a population of 3869. The direct distance across from Holyhead to Kingstown Harbour in the Bay of Dublin, is 64 miles.

MENANDER, a Greek comic poet, one of that class who are called the writers of the New Comedy, was born B.C. 341, and died, as some suppose, by drowning, B.C. 289 or 290. He wrote more than one hundred comedies, of which only fragments remain. All antiquity agrees in praise of Menander.

The plays of Menander were probably very simple in the dramatic action. Terence, who professed to imitate him, did not keep to this simplicity, but, as he tells us himself, he added to the main plot some subordinate one taken from a different piece of Menander; thus, as he says, making one piece out of two.

The fragments of Menander are principally preserved in Athenæus, Stobæus, and the Greek lexicographers and grammarians. A good critical edition of the fragments of Menander and Philemon, by Meineke, was published at Berlin, 1823, 8vo. Many of the fragments of Menander have been well translated by Cumberland in the 'Observer.'

MENANDER, ARRIUS, a Roman jurist, of the time of Sept. Severus and Caracalla. The only work of his mentioned in the Florentine Index is four books on Militaria. There are six excerpts from Menander in the Digest.

MENASSEH BEN ISRAEL, a celebrated Jewish Rabbi, was born in Spain about 1604. He was educated in Holland. When eighteen he succeeded his tutor, Rabbi Isaac Usiel, as preacher and expounder of the Talmud in the synagogue at Amsterdam; and he soon after commenced his work entitled 'Conciliador,' on which his reputation as one of the most learned and accurate of Jewish theologians chiefly rests.

He came over to England during the Protectorate, and was graciously received by Cromwell, from whom he obtained some favours for his nation. He died at Amsterdam about 1659.

The following are his chief works:—'Conciliador nel Pentateucho,' 'De Resurrectione Mortuorum,' 'De Creatione Problemata xxx.,' 'De Termino Vitæ Libri iii.,' 'Spes Israelis,' (and in Spanish, 'Esperanza de Israel,') 'A Defence of the Jews in England,' An edition of the Hebrew Bible.

MENDELSSOHN, MOSES, was born at Dessau in 1729, where his father, Mendel, was a schoolmaster. Being a Jew he instructed his son in the elements of Jewish learning. The celebrated work of Maimonides, 'Moreh Nevochim,' he studied with such zeal that an impaired constitution and a distorted spine were lasting marks of his application. In 1742 he went to Berlin, where he subsisted on the small bounties of the members of his own persuasion. Israel Moses, a Jewish mathematician, urged him to read Euclid's 'Elements;' a physician named Kitsch instructed him in Latin; and by the aid of Dr. Aaron Salomon Gumpertz, he became acquainted with modern literature. He lived for some time in a very humble condition, until a rich silk-manufacturer named Bernard, took him into his house as instructor to his children. He subsequently became a superintendent in the factory, and was ultimately taken into partnership. His intimacy with Lessing began in 1754, and is said to have been of the greatest advantage to him. Philosophy now became his favourite study, and his first work was his 'Briefe über die Empfindungen.' His 'Phädon,' a dialogue on the immortality of the soul, was published in 1767. It is partly translated from the 'Phædon' of Plato and partly original. It was translated into English in 1789, and also in 1838. His 'Jerusalem,

oder über Religiöse Macht und Judenthum' appeared in 1783. He had begun a philosophical work entitled 'Morgenstunden,' when he received Jacobi's 'Essay on the Doctrine of Spinoza.' He thought that this essay charged his deceased friend Lessing with Spinozism. The zeal with which he defended his friend by a written answer excited him to such a degree, that a cold which he subsequently took terminated his existence in 1786. A magnificent edition of Mendelssohn's works was published a few years ago at Berlin.

MENDELSSOHN-BARTHOLDY, FELIX, was born at Berlin, Feb. 3, 1809. His father was the son of Moses Mendelssohn, and being in opulent circumstances, Felix had all the advantages which wealth and intellect could contribute to the proper development of his genius. He mastered the classics and most of the European languages at an early age; but his passion even then was for music. He studied the art to which he was destined to contribute such magnificent works, first under Madame Bigot, and subsequently under Hummel, but chiefly under Zelter, the friend of Goethe. He had a singular facility in acquiring a mastery over all the combinations of keyed instruments. On the organ he was second only to Schneider, and he acquired, with very little trouble, that general knowledge of instruments which is so essential to an orchestral composer and conductor. Zelter introduced him to Goethe, who ever afterwards spoke of him in terms of the highest praise. The easy circumstances of his parents enabled him, in his youth, to travel through Germany, and afterwards to visit England in 1828, on which occasion his overture to the 'Midsummer Night's Dream' was performed at the Philharmonic Concerts with extraordinary success, having previously been performed at Paris. In the previous year he had produced his opera entitled 'Camacho's Wedding' at Berlin, but with small success. After travelling for four years over the continent, he appeared at the Aix-la-Chapelle Festival in 1834; about which time he accepted a music-directorship at Düsseldorf, and became joint manager of the opera with Immermann. While at Düsseldorf he composed his oratorio of 'St. Paul.' Shortly after he married, and in 1835 took up his residence at Leipzig, in the capacity of director of the concerts, and was made a doctor by the university of that town. He resided at Leipzig, with occasional absences for professional purposes—such as his visits to Brunswick, Cologne, and England, where the performance of his masterpiece, 'Elijah,' at the Birmingham Festival of 1836, elicited enthusiastic applause—till his death, which took place on the 4th of December, 1847, at Leipzig.

Mendelssohn's compositions include almost every kind of musical composition. Among his works not already mentioned are—three grand symphonies; four grand romantic concert overtures; the cantata on Goethe's 'First Walpurgis Night;' two oratorios, the 'St. Paul' and the 'Elijah;' the choruses to the 'Antigone' of Sophocles; the 'Lobgesang;' 'Lauda Sion,' and the 'Lieder ohne Worte.' The amount of his concerted vocal music, single songs, and chamber music, is extensive: some of his last vocal pieces were written for Jenny Lind.

MENDE. [LOZE'RE.]

MENDIP HILLS. [SOMERSETSHIRE.]

MENDOZA, IÑIGO LOPEZ, better known as the Marques de Santillana (Sancta Juliana), was born in 1398, at Carrion de los Condes, in Spain, and died in 1458. He was grandson of the poet Pero Gonzalez Mendoza, and a descendant of that Mendoza who, in the battle of Aljubarrota, saved the life of Juan I. at the expense of his own. Santillana was the most elegant scholar at the court of Juan II., then the most brilliant in Europe. Much of his poetry is still in MS., and is partly lost or lying in dust. Several of his pieces however, chiefly devotional and amatory, are contained in the older Cancioneros. By introducing the sonnet, Santillana became a forerunner of the bold innovator Boscan. But he did more, by endeavouring to impart a moral tendency to the national poetry, by extending it by allegorical invention, and embellishing it with learning. His efforts in that respect are apparent in his 'Elegy to his tutor and friend Villena,' and his 'Doctrinal de Provados.' His 'Refranes' (traditional proverbs) were reprinted by the learned Mayans (*Origenes de la Lengua Castellana*, vol. i., p. 179).

MENDO'ZA, DIE'GO HURTA'DO, a scholar, statesman, and general under Charles V., was grandson of Iñigo Lopez Mendoza, and younger son of the first Marquis of Mondejar, who was also second Count of Tendilla. He was born in 1503 at Granada. After learning Arabic at Granada, he studied Latin, Greek, Hebrew, divinity, and civil and canon law at Salamanca, where, by way of relaxation, he produced the first specimen of the comic romance in his 'Lazarillo de Tormes.' In his capacity of ambassador at Venice, at Trent, at Rome, the centre of intrigue, and as general in Tuscany, which was threatened by the Turks and their ally Francis I., he defeated the treachery of the French king, and baffled the designs of the opposing parties. By his opposition he prevented the transfer of Milan and Siena to Paul III. Italy was indebted to him for having introduced into it the writings of Basil the Great, Gregory of Nazianzus, Cyril of Alexandria, Archimedes, Appian, and others. Not satisfied with employing Arnoldus Ardenius in transcribing the Greek MSS. of different libraries, Mendoza sent Sophianus of Corcyra to Thessaly and Mount Athos in search of manuscripts. In 1555 Mendoza was superseded as ambassador at Rome, and he subsequently fell under the displeasure of Philip II., who banished from his court this old servant, then 64 years of age. This act of royal severity proved however beneficial both to the illustrious veteran and to posterity. In his retirement at Granada Mendoza investigated antiquities, collected above 400 Arabic MSS., and crowned his literary fame by his history of the 'Guerra contra los Moriscos.' He died in 1575, at Valladolid.

MENDOZA. [PLATA, LA.]

ME'NE'HOULDE, SAINTE. [MARNE.]

MENELA'US (called also MILLEUS by

Apian and Mersenne, but on what authority is not known), was an Alexandrine, who observed the stars for a long while at Rome, and was living there in the time of Trajan. He is mentioned by Proclus and Pappus. The only writing of Menelaus which has come down to us is the Latin treatise on spherical geometry, translated from the Arabic; the Greek is probably lost. This work, in three books, was published (Lalande) in a collection of Greek geometers made at Paris, in 1626; and afterwards (Lalande, Heilbron) by Mersenne, in his 'Universæ Geometriæ Synopsis,' Paris, 1644. The books of Menelaus on spherical geometry have been much used by Ptolemæus in the 'Syntaxis,' and the latter had for a long time the credit of two very remarkable propositions which appear in Menelaus, and which have been much used by Carnot and others in the modern extensions of geometry. These are the well known propositions relating to a transversal which cuts the three sides of a triangle, plane or spherical. There are other propositions of great ingenuity; so that Menelaus, who must be looked on as the successor of Hipparchus and Theodosius in the school of Greek geometers who treated of the doctrine of the sphere, must also be considered as having gone considerably beyond his predecessors.

MENES. [Egypt.]

MENGS, ANTON RAFAEL, was born at Aussig in Bohemia, in 1728. He underwent a rigorous artistic education under his father, who was a painter. In 1741 his father quitted Dresden, whither he had been called by Augustus III. (for he was a native of Denmark), and went to Rome, taking young Mengs with him, where his father made him labour severely in the Vatican, scarcely allowing him time to take his meals. In 1744 he returned with his father to Dresden, when Augustus appointed him court-painter, but he was permitted to return to Rome to continue his studies for some time longer. He soon began to distinguish himself by his original compositions, among the rest by a Holy Family, in which the Virgin was painted from a beautiful peasant girl, of whom he became so enamoured that he turned Catholic for her sake and married her. After that event he again returned to Dresden, where his pension was raised to a thousand dollars, and he was commissioned by the king to paint a large altar for a new chapel, which he wished to execute at Rome; but on his arrival there other commissions (among which was a copy of Raffaelle's 'School of Athens' for Lord Percy, afterwards Duke of Northumberland), and the Seven Years' War, which caused the stoppage of his pension, interfered with the prosecution of the work. His 'Apollo and the Muses,' another work of the same class, in the Villa Albani, obtained for him much greater renown, and is one that will bear comparison with those by the greatest Italian masters. About this time he became acquainted with Webb, to whom he communicated his ideas on art, which the other passed off as his own in his 'Remarks on Poetry and Painting.' Mengs's reputation was greatly increased by the numerous works he executed for Charles III. of Spain. His pencil was employed in decorating the royal palaces of Spain; and the Apotheosis of Trajan, in that of Madrid, is considered his chef d'œuvre. He died June 29, 1779.

MENIN. [Flanders, West.]

MENISCUS. [Lens.]

MENISPERMA'CEÆ are an important and extensive natural order of Exogenous plants, considered by some to be Polypetalous, and referred to De Candolle's *Thalamifloral* subclass; by others placed among the *Monochlamydeæ* of that author. The wood of the stem is arranged essentially upon the Exogenous plan, but has some striking peculiarities. According to M. Decaisne, it has no annual concentrical layers. The woody plates are always simple, and do not divide longitudinally, as in other Dicotyledons, but increase each year by the formation of a new woody layer outside the former and inside the liber. The latter ceases to grow after the first year.

Menispermaceæ are usually bitter and tonic plants. The species of *Cocculus* called *Bakis Fibraurea, cinerascens,* and others, are used in their native countries as a remedy for intermittent fevers. *Cocculus palmatus* furnishes the Calumba Root of the shops, a valuable bitter.

MENISPERMUM, a genus of the natural family of *Menispermaceæ,* which formerly contained numerous species, many of them valuable for their medicinal and other qualities, such as the Calumba Root, and the berries called *Cocculus Indicus,* which are now referred to the genus Cocculus.

MENNONITES, a religious sect which sprung up in Holland and Germany about the time of the Reformation, and which is identified by many writers with the sect of the Anabaptists, with whom the Mennonites held several leading doctrines in common. [Anabaptists.] They receive their appellation from Simon Menno, who was born at Witmarsum, a village in Friesland, in the year 1505.

The followers of Menno very soon split into two sects, the Flemings and the Waterlandians, so called from the countries in which they arose. In the 17th century the Mennonites obtained toleration in Holland, Germany, and England. In the year 1630, a considerable part of the sects arranged their differences in a conference at Amsterdam, and formed a union, which was renewed in 1649.

MENORCA, or MINORCA. [Balearic Islands; Spain.]

MENSURATION is the name given to that branch of the application of arithmetic to geometry which shows how to find any dimension of a figure, or its area, or surface, or solidity, &c., by means of the most simple measurements which the case will admit of. We need hardly say that a complete treatise on this science would involve every branch of mathematical science.

MENTHA PIPERI'TA (Peppermint); a plant common in many parts of Britain, but cultivated for medical purposes. The dried plant, which is more powerful than the fresh, is of a livid green, with a peculiar aromatic odour, and a pleasant camphor-like taste, at first burning, but

last causing an enduring sensation of cold in the mouth. The dried herb is used for the preparation of a distilled water and of a volatile oil, from which oil, spirits, or essence of peppermint is prepared. Of the oil three varieties occur in commerce, the German, English, and American.

MENTHA PULE'GIUM (Pennyroyal), an indigenous species of mint, smaller than most of the others, and of which the entire herb, except the root, is officinal. The odour is strong and peculiarly aromatic; the taste herbaceous and bitterish. It has a stimulant and antispasmodic property, similar to most mints. A distilled water, a spirit, and volatile oil are prepared from it, as from the preceding species.

MENTHA VI'RIDIS (Spearmint), a plant of Britain, very much resembling *M. piperita;* the colour however is of a deep green. From it are prepared a distilled water, a spirit, and a volatile oil, which are used as the former.

MENTZ. [MAINZ.]

MENURA. [MÆNURA.]

MENYANTHES TRIFOLIA'TA (officinal part, the leaves), a plant common in our bogs, and hence called Bog-Bean, as its leaves resemble the common bean. It contains an extractive (Menyanthin), which is a tonic and febrifuge medicine of undoubted efficacy. The chief use said to be made of the large quantity annually collected is to substitute it for hops in brewing.

MENZIKOFF. [PETER I. the Great.]

MEQUINEZ. [MAROCCO.]

MEPPEN. [AREMBERG.]

MER. [LOIR-ET-CHER.]

MERCAPTAN, a compound of hydrogen, carbon, and sulphur, discovered by Zeise, and so called from its energetic action on binoxide of mercury (corpus *mercurium captans*). It is a colourless liquid, has a penetrating alliaceous smell, and a peculiar sweetish taste; its specific gravity is 0.842, it boils at 144°, and remains fluid at 8°. Water dissolves it sparingly, but æther and alcohol unite with it in all proportions. According to Zeise it consists of H^6 C^4 S^2.

MERCA'TOR, GERARD (whose real name was Kauffman, of which *Mercator* is the Latin equivalent), was born at Rüppelmonde in East Flanders, in the year 1512. He applied himself with great industry to the sciences of geography and mathematics, was patronised by the Emperor Charles V., and appointed, in 1559, cosmographer to the Duke of Juliers. He gave his name to the method of geographical projection now usually employed in the construction of nautical maps, in consequence of his having first represented the meridians by equidistant parallel lines, and the parallels of latitude by straight lines at right angles to the meridian, but he did not know the distance which ought to separate these parallels. Nicholas Mercator is said to have discovered the law which regulates these distances; but the English mathematicians having refused to pay for the promulgation of his discovery by accepting a pecuniary challenge which he is said to have proposed to them, he died without communicating it even to his friends. The credit of first investigating the principles of that projection, and applying them to the purposes of navigation, appears to be due to Edward Wright. Gerard Mercator died at Doesburg, December 2, 1594.

MERCATOR, NICHOLAS (whose real name was Nicholas Kauffman), was born at Holstein, in Denmark, in 1640. At an early age he was engaged in a correspondence with some of the principal geometricians of Denmark, Italy, and England. In 1660 he came to England; and shortly after the formation of the Royal Society he was elected a member of that body. The date of his death is uncertain. According to Dr. Hutton, it took place in England in the year 1690 ('Mathematical Tracts'), or in 1694 ('Mathematical Dictionary'); but, according to Weiss ('Biog. Univers.'), he died at Paris, February, 1687. The reputation of Mercator rests principally upon a method, of which he was the author, whereby the area of the spaces comprised between the hyperbola and its asymptote may be determined arithmetically to any degree of approximation required; and upon the application of this method to the construction of logarithmic tables.

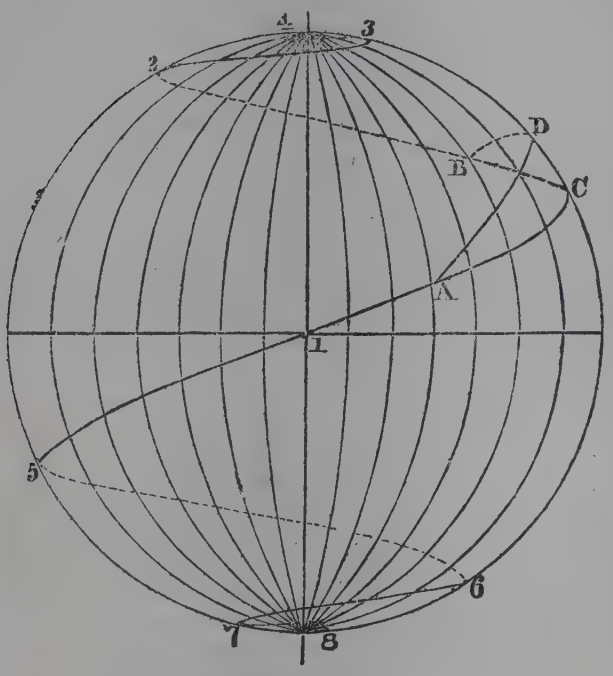
MERCATOR'S PROJECTION. It is our object in this article to endeavour to describe the projection, the use of which constitutes the principal difference between the methods of travelling by land and by sea, in such a manner as rather to give information to the landsman than the rules by which the mariner is guided. Perhaps there is no point of navigation on which a person who is neither a seaman nor a mathematician has so little chance of gaining any information from popular works.

We shall suppose the ship a mathematical point in comparison with the earth, and imagine the whole of the latter to be covered by sea. Also let the ship be always sailing before the wind, and no allowance for leeway or currents to be necessary. Throw out also the variation of the compass, that is, suppose the needle always to point due north.

A ship thus circumstanced, if it should continue sailing due north, would in time reach the north pole on a meridian circle of the sphere, on which, if it still kept its course, it would proceed due south, and would at last reach the south pole: such a ship would never change its longitude, except at the moment of passing either pole, when the longitude would alter at once by 180 degrees. If however the vessel sailed continually due east or due west, it would sail upon a small circle of the sphere, being always at the same distance from the pole, and always in the same latitude. In the first case the differences of latitude would give the distances sailed over, at the rate of 60 nautical miles to a degree; in the second case, the differences of longitude, reduced in the same way, and the results multiplied by the cosine of the latitude, would serve the same purpose.

But suppose that the vessel took an intermediate course, say north-east. It would not sail on any circle of the sphere, great or small; for by hypothesis the line of the course is always making an angle of 45 degrees with the meridian; and there is no circle (unless it be the meridian

itself, or a parallel of latitude, the equator included) which always makes the same angle with the meridian. Neither could the vessel, keeping such a course, reach the pole; for at the moment when it touches the pole, it is sailing north; whereas by hypothesis it is always sailing north-east. The fact is, that a curve which makes equal angles with all meridians, must be a spiral which approaches the pole, encircling it with an infinite number of folds, but never actually reaching it, as in the following diagram, in which the curve 1, C, 2, 3, 4, &c., is that on which a ship would sail from 1 towards the north pole on a course east-north-east, and the curve 1, 5, 6, 7, 8, &c., is that of a course west-south-west towards the south pole. The dotted part of the figure is supposed to be on the other, or the invisible, side of the sphere. A ship sailing from A to B over A C B, keeps one course; but were it to sail over the great circle A D B, the course must be perpetually altering.



The spiral A C B is the only one on which a ship should sail directly from A to B, though there is an infinite number of such curves which pass through both A and B, the reason being, that in every other spiral except A B, one or more complete circuits in longitude must be made, and the ship would come again to the meridian passing through A before it reaches B. In the same manner a spiral might be found passing through A and B, which cuts the meridian of A five hundred times before it passes through B. Of course the shortest course is always preferred; and it is the object of Mercator's projection to lay down such a map of the world that the straight line joining two points shall be the map of the course which must be followed in order to sail from one to the other in the most direct manner, consistently with always keeping the same point of the compass.

The spirals above described are called loxodromic spirals, or rhumb lines. [RHUMB.] Our present object is not to explain those lines, but to turn the globe into one of Mercator's maps, in a manner which will give the unmathematical reader some idea of its construction. For this purpose suppose the map of the world to be painted on the globe and let the globe be made of a thin and very elastic material. Let the elasticity of this materia increase as we go towards either pole, and s rapidly that it becomes as great as we please a and near the poles. Let the equator be immove ably connected with the internal centre (supposed fixed) of the globe. If then the north and south poles be pulled away from the equator, th thin membrane of the sphere will be extended and if the pull be continued until the poles ar sufficiently distant, a large portion of the spher on each side of the equator will assume a cylindri cal form, or one nearly cylindrical; and the greate elasticity of the upper parts will cause the sma folds of the different spirals to be much more ex tended than the larger ones, so as to becom equal to them. Let the mathematical hypothesi implied in the preceding be carried to its ex treme limit, that is, let the poles be pulled to a infinite distance; and let the law of the elas ticity be such, that the several loxodromic spira shall have precisely similar successive folds on th resulting cylinder, that is, let them take a regula screw-like form. The meridians will then a become straight lines parallel to one another; an if the membrane be then fixed in its cylindrica shape, that is, if it lose its elasticity, and if one the meridians be slit all the way down, and th cylinder unrolled into a plane, we shall hav before us Mercator's projection, as shown in th usual maps. The degrees of longitude remai everywhere the same, those of latitude increa sensibly. The loxodromic spirals, which are co verted into screws on the cylinder, are unrolle into straight lines.

MERCIA. [ENGLAND.]

MERCIER, LOUIS SEBASTIEN, was bo in Paris, June 6, 1740. He was for some yea professor of rhetoric in the college of Bordeau He was a prolific writer on men and manner politics, literary criticism, and many other su jects. In 1781 he commenced the publication the 'Tableau de Paris,' in which he attacked th social and political institutions of France, and doubt contributed in some degree to produce th French Revolution. The greater part of his oth works are now forgotten. He died April 25, 181

MERCURIA'LIS, a genus of plants belongi to the natural order *Euphorbiaceæ*. *M. perenn* Perennial Mercury, is a native of woods a thickets in Great Britain. *M. annua*, Annu Mercury, is a common plant in waste uncultivat lands. It once had a place in the British Pha macopœia on account of its supposed efficacy an emmenagogue, but it is not now used for th purpose.

MERCURY, or QUICKSILVER. This met which possesses the remarkable property of bei fluid at usual temperatures, has been known fr the remotest ages. Although it is met with very large quantity, yet the mines occur in co paratively few places; those of Almaden in Spa and Idria in Carniola, are the most importa There are however mines of this metal in Hunga Transylvania, and the district of Zweibrücken

Germany. Mercury has been obtained for a very long time in China and Japan, and although the amount of the produce is unknown, there is every reason to think it is considerable; it is also found at Huancavelica in Peru. The average yearly produce is estimated at about 2000 tons, of which about two-thirds come from Almaden. The quantity brought to England in 1848 was 1,562,663 lbs.

Mercury is always obtained from cinnabar, which is a bisulphuret of the metal; it is found in the red sandstone associated with coal at Almaden; sometimes, as in the district of Zweibrücken, the cinnabar occurs in the subordinate porphyries; and at Idria in the subordinate bituminous schist, but rarely in limestone itself.

Various processes are adopted for the purpose of separating the mercury from the ore, all of which depend upon the volatility of the metal, its conversion into vapour in distilling vessels or retorts, and its condensation by cold. In order to separate the sulphur from the metal, either iron or lime may be employed; the first forms sulphuret of iron, and the latter of calcium, with the sulphur, and the metal is thus set free, volatilised, and condensed. The retorts employed are made of cast or sheet iron, or earthenware.

Mercury is fluid at ordinary temperatures, is of a silvery white colour, and possesses a high degree of lustre; it is inodorous, tasteless, unacted upon or very slightly by exposure to air at common temperatures, and not at all by water at any temperature. The specific gravity of mercury is about 13.568. It boils at 670°; the density of its vapour is 6.976; and yet it vaporises at common temperatures. At 40° below zero, mercury becomes solid, crystallises in octahedrons, and gives a dull sound like lead; at the moment of congelation it contracts considerably; when in this state it is malleable, and may be cut with a knife. Mercury is a good conductor of electricity and of heat, but its capacity for heat is extremely small; it expands uniformly at all temperatures between its boiling and freezing points.

The chief *Ores of Mercury* are the following:—*Native Mercury* occurs in but few places, and is met with in small cracks or crevices of the rocks in which the common ore occurs, and is frequently accompanied by red silver. *Chloride of Mercury*, which is known by several names, is a grayish, translucent, prismatic crystal. *Bisulphuret of Mercury*, known also as *Cinnabar*, or *Vermillion*, is a red translucent substance, sometimes crystalline and sometimes massive. *Native Amalgam*, or a compound of mercury and silver, is a white opaque substance, generally crystallised in cubes.

The principal combinations of mercury with the other simple substances are the following:—

Oxygen and Mercury combine to form two compounds, the protoxide and binoxide. The protoxide ($M^1\ O^1$) is nearly black, insoluble in water and the alkalis. It is totally volatilised by heat; and even by being kept out of the action of light is apt to separate into mercury and peroxide. The binoxide ($M^1\ O^2$) is a dark red crystalline substance, formerly used in medicine under the name of *Mercurius præcipitatus per se*. It is inodorous, acrid to the taste, and slightly soluble in water. At a red heat it is decomposed. *Chlorine and Mercury* form two compounds of great importance, the *protochloride* (*calomel*), and the *bichloride* (*corrosive sublimate*). The chloride ($M^1\ Chl^1$), when procured by precipitation is a white pulverulent substance, whereas that obtained by sublimation is crystalline, hard, and dense; its specific gravity is 7.175; it is colourless, inodorous, insipid, and sometimes regular crystals are observed, the primary form of which is a square prism. It is quite insoluble in water. The bichloride ($M^1\ Chl^2$) is a white semi-transparent crystalline mass, and perfect crystals are occasionally obtainable, the primary form of which appears to be a right rhombic prism. This substance is inodorous, its taste is nauseous and acrid, and it is a violent poison. *Cyanogen and Mercury* combine to form one compound, which is a bicyanide ($M^1\ Cy^2$). It is obtained in colourless crystals, the primary form of which is a right square prism; this salt has a metallic taste, and is poisonous. By heat it is decomposed, and cyanogen gas is obtained. *Fluorine and Mercury* combine to form a bi-fluoride of mercury, an orange-coloured substance. *Bromine and Mercury* form two compounds, a white curdy bromide, and a crystalline bi-bromide.

Sulphur and Mercury unite in two proportions, forming the sulphuret and the bi-sulphuret. The sulphuret ($M^1\ S^1$) is a black powder, insoluble in water, and volatilised at a high temperature. The bi-sulphuret ($M^1\ S^2$), before alluded to as forming cinnabar or vermilion, may be produced artificially; it is a compact, deep red, crystalline mass, inodorous, insipid, and insoluble. A black mixture of mercury and sulphur forms the *Ethiops Mineral*. *Phosphorus and Mercury* form a brownish insoluble compound. *Iodine and Mercury* form two compounds; the iodide ($M^1\ I^1$) is a greenish yellow powder, inodorous, insoluble, but very sensitive to light; the biniodide ($M^1\ I^2$) is a fine red precipitate, which fuses readily, and sublimes into scaly crystals. *Selenium and Mercury* combine to form a tri-coloured substance.

Metals and Mercury, or the greater number of them, readily combine; other metallic compounds are termed *alloys*, but those which contain mercury are called *amalgams*.

Mercury combines with many acids to produce salts; among which acids the chief are—*nitric*, *muriatic*, *sulphuric*, *carbonic*, *phosphoric*, *fulminic*, and *acetic*. The best known of these salts is *Turbeth Mineral*, composed of oxide of mercury and sulphuric acid, and *Fulminate of Mercury*, a detonating substance, composed of protoxide of mercury and fulminic acid. In respect to the salts of mercury generally, the soluble salts of the protoxide are mostly white, of a metallic taste, and not virulently active as poisons. Some of them, when neutral, are resolved by water into basic and acid salts. The soluble salts of the peroxide or binoxide are mostly white when neutral, yellow when basic; they are poisonous, and nauseously metallic to the taste, and are often resolved by water into acid and basic salts. Mercurial salts are mostly volatilised at a red heat.

The uses of mercury in the arts are numerous and important. It is used in the extraction of gold and silver from their ores, in gilding, in the silvering of mirrors, and in filling thermometers and barometers. Bichloride of mercury has been of late years extensively used for the prevention of dry-rot; and this metal is also extensively employed in various forms in medicine.

Medical Properties of Mercury.—In a purely metallic state, mercury, when taken into the human stomach, produces no effects except such as are owing to its mechanical properties. Nevertheless it may become oxidized, and, by combining with some of the acids of the stomach, occasion violent disorder. Even its external application leads to similar results, from the metal first becoming oxidized, then absorbed, and producing the same effects as if taken by the mouth. The preparations of mercury differ very much in the degree of their action, both according to the nature of the combination, and also of the dose employed or the mode of administration. The milder preparations seem only to increase the natural and healthy actions of the organs of the body, particularly the secreting and exhaling organs; while the more active, if not given in very minute doses, destroy the texture and impair the function of many organs, both those with which they are brought into immediate contact, and others which they affect by sympathy or other means. No medicinal substance is capable of producing so much benefit, none is so frequently abused, or so fertile a source of injury, as mercury.

In the treatment of diseases, four distinct effects may be obtained from the employment of mercurial preparations. 1st. By some of them the intestinal canal is irritated, and the expulsion of its contents occasioned. 2nd. Others are used to create a general commotion of the system, to rouse the lymphatics, and excite both the secreting and excretory glands. 3rd. To control or altogether change the action of the capillary vessels, when that is extreme and tending to the effusion of serum, and more especially of coagulable lymph. With this may perhaps be joined the action of the mercury as an alterative. 4th. What is regarded as its specific effect in bringing about the cure of some peculiar diseases.

Calomel, or the protochloride of mercury, is the preparation most employed as a purgative; it influences the intestinal canal along its whole length, and excites the liver and other glands to secretion. It is of very great utility, not only at the commencement of fevers, but even during their course, either when given alone or in conjunction with some other purgative. It exercises also a peculiar influence in the various forms of acute inflammatory diseases. The unnecessary use of mercury, when some other purgative would have answered as well, is much to be reprobated, and not only injures the constitution of children, but if they are teething at the time, it leads to the early decay of their teeth. In cases of poisoning by mercury, the antidotes most proper are those substances which contain albumen, such as white of egg, milk, flour, &c. Great injury is done to the system by the incautious use of quack remedies containing mercury.

MERCURY, DEPRESSION OF. [Depression of Mercury.]

MERCURY, the planet nearest to the sun. Its orbit being entirely within that of the earth, it never recedes to the point of the heavens opposite to the sun, but is always found within 29° of the sun. Hence it is only visible to the naked eye in the evening when it is to the east of the sun, and near to its greatest distance (or elongation) from the sun, so that the sun can descend sufficiently below the horizon to allow the planet to be seen just before its setting; similarly, it is only visible in the morning (before sunrise) when it is near its greatest elongation westward of the sun. The phases of Mercury are not visible without a telescope. The apparent diameter of Mercury varies from 5 to 12 seconds; the real diameter is .398 of that of the earth, or about 3140 miles. Its bulk is to that of the earth as 63 to 1000; its mass is reckoned at the two-millionth part of that of the sun. It revolves on an axis, the inclination of which to the ecliptic is not determined in $24^h\ 5^m\ 28^s.3$. It has seven times the light and heat of the earth; and its mean distance from the sun is .387 of that of the earth.

The transits of Mercury, or passages of the planet over the sun's disc, take place when the conjunction (the inferior conjunction, as it is called) Mercury being between the earth and the sun happens at the time that the planet is near its node. These transits are not so useful in the determination of the sun's parallax or the longitude of the place of observation as those of Venus. The following are, according to Delambre, the times of the transits which will yet take place the present century (civil time at Paris):—

1861	12 Nov., 7½ A.M.	1881	8 Nov., 1 A.M.
1868	5 Nov., 7 A.M.	1891	10 May, 3 A.M.
1878	6 May, 7 P.M.	1894	10 Nov., 6½ P.

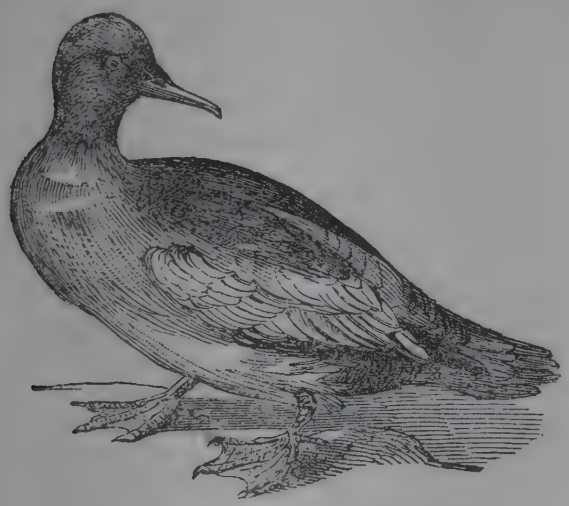
MERGANI'NÆ, a sub-family of the *Anatid* including the *Goosanders*, or *Mergansers* (*Harles* of the French), and constituting the genus *Mergus* of Linnæus.

In the genus *Mergus* the beak is more slend and more cylindrical than in the ducks; ea mandible is furnished along its edges with sm pointed saw-like teeth, directed backwards; t tip of the upper mandible is hooked. In th general aspect and plumage these birds approa the true ducks, but their gizzard is less muscul and the intestinal canal and its cæcal appenda are shorter.

In the males the lower larynx is dilated in an enormous bulla or drum, partly membrano Habits, aquatic; food, fishes and their fry. Hi toe lobated.

'The members of this genus swim well, from the weight and flattened form of their bod appear deeply immersed in the water, the he neck, and back only being visible. They also excellent divers, moving, or rather flyi beneath the surface with great rapidity and t great distance at a time, and by these submar flights they capture their finny prey. Their fli

is strong and swift, and they have great endurance on wing, but from the shortness and backward position of the legs are awkward upon land. They are natives of the colder climates, and are found during the summer or breeding season in very high latitudes. The males after pairing time are subject to a partial change in the colour of their plumage, similar to that which takes place in many species of the sub-family *Anatina*.'—Selby. [Ducks.] We may enumerate as examples the Goosander (*Mergus merganser*), the Red-Breasted



Goosander (*Mergus merganser*)

Merganser (*M. serrator*), the Hooded Merganser (*M. cucullatus*), and the Smew, or White Nun (*M. albellus*).

(Selby, Gould, Yarrell, Bewick, Pennant, &c.)

MERGER. In order to understand the legal term Merger, it is necessary to comprehend the term Estate. 'The accession of one estate to another, or, more accurately speaking, the circumstance that two estates immediately expectant on each other, meet or are united in the same person, is the cause of the merger.' (Preston.) This consequence, called merger, is that the preceding estate ceases to exist, and the estate in which this preceding estate is said to be merged continues to be exactly the same as it was before that union which was the cause of merger.

The estate which is prior in point of time must not be greater (in legal estimation) than the estate which immediately follows: it may be either equal or less, but not greater. Also, the estates must both be vested estates, and both must be legal or both equitable estates.

The whole subject of Merger is discussed at great length in the third volume of Mr. Preston's 'Treatise on Conveyancing;' and the origin of merger in Preston's third volume, chap. iii., &c. The Romans had a doctrine similar in some respects, so far as their system allowed ('Dig.' 7. 4. 17; 'Inst.' 2. tit. 4).

MERGUS. [Merganinæ.]

MERIAN, MATTHEW, was born at Basel, in 1621. He was the pupil of Sandrart; he studied also after Vandyck in London; became acquainted with Le Sueur and Vouet in Paris, and studied under Sacchi and Carlo Maratti at Rome. He painted the Emperor Leopold I. on horseback, and many other German princes and nobles. He also painted some historical pieces, and engraved a few plates. He died at Frankfort in 1687.

MERIAN, MARIA SIBYLLA, the daughter of Matthew Merian, was born at Frankfort-on-the-Main, April 12, 1647. In 1665 she married John Andriez Graff, a painter of Nürnberg, but the celebrity attached to her own name as a painter induced her to retain it. In consequence of liberal offers Madame Merian and her husband settled in Holland, but as her great object was the study of nature, she travelled for the sake of delineating insects, flowers, and other natural objects. In 1699 she went to Surinam, for the express purpose of making the drawings which have since added so considerably to her fame, and remained there till the month of June, 1701.

She published—1, 'The Origin of Caterpillars, their Nourishment and Changes,' in Dutch. This work, much enlarged by herself and her daughters, was published in French by John Marret, fol., Amst., 1730, under the title of 'Histoire Générale des Insectes de l'Europe.' 2, 'Dissertatio de Generatione et Metamorphosibus Insectorum Surinamensium.'

Madame Merian died at Amsterdam, January 13, 1717. Many of the original drawings of this artist are preserved in the department of drawings and prints in the British Museum, in two volumes, purchased by Sir Hans Sloane at a large price. Other drawings of Madame Merian are preserved at St. Petersburg, in several collections in Holland, and at Frankfort.

MERIDA. [Estremadura, *Spanish*.]

MERIDIAN (*meridies*, mid-day). In the heavens the meridian is the circle which passes through the pole and the zenith of the spectator: on the earth it is the circle which passes through the pole and the spectator's position; consequently the terrestrial meridian is the section of the earth made by the plane of the celestial meridian.

The circle derives its name from being that on which the centre of the sun is found at mid-day, or real noon. In the case of a fixed star, the time at which its altitude is greatest is the moment of its coming on the meridian; but in that of the sun or a planet, the orbital motion prevents the moment of its culmination (or coming on the meridian) from being exactly that of its attaining its highest point; though the difference is not worth noting for ordinary purposes.

MERINO. [Sheep.]

MERIONETHSHIRE, a county of North Wales, is bounded N. by Caernarvonshire and Denbighshire, N.E. by Denbighshire, E. and S. by Montgomeryshire, S. by Cardiganshire, and S.W. and W. by Cardigan Bay, an inlet of the Irish Sea. Its greatest length, N.E. to S.W., is 45 miles; its greatest breadth, N.W. to S.E., is 30 miles. The area is 663 square miles. The population in 1841 was 39,332.

Coast Line and Surface.—The northern part of the coast is formed by the æstuary of which the Traeth Mawr and the Traeth Bach are portions. From the Traeth Bach the coast runs south about six miles past Harlech to the little headland on which stands the village of Mochraes or Mochras. The

coast is skirted by sands dry at low water, and at some distance out to sea are three sand-banks, the 'Dutch Bank,' the 'Pontigal Bank,' and the 'Sarn Badrig.' This remarkable shoal runs from the immediate neighbourhood of the coast 22 miles out to sea in a south-west direction; it is composed of sand and gravel. It is dry at the ebb in spring tides, and in storms is marked by fearful breakers. From Mochraes the coast runs S.S.E. to Barmouth, and thence S. to the Dovey and the Towy. There are few cliffs along the coast. Merionethshire is the most mountainous of all the Welsh counties, and contains some of the loftiest peaks in North Wales. The Berwyn mountains traverse the county from north-east to south-west, skirting the valleys of the Dee, the Wnion, and the Maw. Many of its summits are from 2000 to 3000 feet high. There are other mountain groups and offsets.

The county is almost entirely occupied with the slate rocks which predominate in North Wales. Along the valley of the Dee, as far up as Bala and the valley of the Elwen, a bluish-gray limestone is found, which is quarried for lime, the principal manure employed in the county. Great quantities of white limestone are quarried and burnt for lime near Corwen. Westward of the limestone the rocks are chiefly slaty, forming abrupt and rugged mountains of desolate appearance. Lead and copper mines are worked near Towyn at the mouth of the Disynwy, and copper mines near Barmouth. There are slight indications of volcanic agency among the mountains.

The principal rivers belonging to the county are the Dee, the Maw, and the Dovey, with their respective affluents. The Dee rises near the Berwyn Mountains, and flows through Lake Bala into Denbighshire; it receives the Lew, Twrch, Glettwr, Alwen, and other small streams. The Maw, the Dovey, and the Disynwy all rise within the county, and, after receiving many small streams, fall into the Irish Sea.

There are many lakes, most of them small. The largest are Llyn-Tegid, or Bala Lake, and Llyn-y-Myngil.

There are no canals or railways in the county.

Divisions and Towns.—Merionethshire is divided into five hundreds. It is in the dioceses of St. Asaph and Bangor. It is in the North Wales Circuit, and the assizes are held at Bala in the spring, and at Dolgelly in the summer. The county returns one member to parliament.

The only towns which require to be noticed are the following:—

Bala, a market town, 18 miles N.E. from Dolgelly, is situated at the northern end of the lake called Bala Pool. The town consists chiefly of one wide street. Some flannels, stockings, and gloves, are manufactured. The population of the town in 1841 was 1257.

Bala Pool is the largest lake in Wales. It is 4 miles long, but less than a mile in width, and has an average depth of 40 feet.

Barmouth, a small market town and seaport, 8 miles W. by S. from Dolgelly, is situated on the north side of the æstuary of the river Maw, or Mawddach, at the foot of a lofty mountain, and the houses rise in a succession of terraces, which communicate by flights of steps. A few sloops belong to the port, and some flannels are exported. It is resorted to in summer as a pleasant place for sea-bathing. The population of the town in 1841 was 930.

Dolgelly, the chief town of Merionethshire, is situated on the south bank of the river Wnion about a mile above its junction with the Maw. It is 208 miles from London by the Shrewsbury road. The town stands in a pleasant valley, and consists mostly of narrow streets of small houses. Coarse woollen cloths and flannels are manufactured, and there are fulling mills and bleaching grounds in the neighbourhood. The church is a neat structure, and there are some places of worship for dissenters. The population of the town in 1841 was 2016.

Harlech, 14 miles N.W. from Dolgelly, is seated near the shore of Cardigan Bay. It is little more than a village of small size and insignificant appearance, situated between a wild and desolate mountain country and the sea. The most striking object is the castle, the ruins of which are situated on a lofty rock facing the Bay, and rising above an extensive marsh once occupied by the sea. Its walls are tolerably perfect; they form a square of about seventy yards each way, with a round tower at each corner.

History and Antiquities.—In the earliest period of the authentic history of the island Merionethshire was included in the territory of the Ordovices. In the Roman division of the island, it was included in the province of Britannia Secunda. It is said to have been called Mervinia by the Romans.

There are several traces of Roman works in this county. There are remains of camps near Bala, and in the immediate neighbourhood of that town is Tommen-y-Bala, an artificial mound supposed to be a Roman work.

During the Saxon period and the reigns of the earlier English kings of the Norman dynasty Merionethshire does not appear to have been the scene of events of historical interest.

In the war of the Roses, Harlech was held for the Lancasterians, but was taken by Sir Richard Herbert. In the civil war of Charles I., Harlech Castle was the object of contention. The repeated captures of this place, and a skirmish near Dolgelly, which had been garrisoned for the parliament, were the only incidents of the contest which occurred within the county.

The principal remains of the middle ages are Harlech Castle, the ruins of Cymmer Abbey, near Dolgelly, and two or three small castellated buildings.

MERIVALE, JOHN HERMAN, was born at Exeter in 1779. Mr. Merivale entered St. John's College, Cambridge, in 1797, but took no degree, in consequence of his dissenting opinions, although at a later period he joined the Church of England. He was called to the bar in 1805, and practised in the Court of Chancery. He published three volumes of Chancery Reports from 1815 to 1817, of cases decided by Lord Eldon and Sir William Grant. In 1825 he was

a member of the commission for inquiring into the state of the Court of Chancery, and wrote a 'Letter on the Chancery Commission' in 1827, as well as some other pamphlets on law reform. He became a commissioner of bankrupts in 1831; and continued to hold that office till his death in April, 1844. He contributed a large proportion of the translations contained in the 'Collections from the Greek Anthology,' published in 1813, of which Mr. Merivale brought out a second edition, enlarged, in 1833. In 1814 appeared his poem of 'Orlando in Roncesvalles.' In 1841 Mr. Merivale published two volumes of 'Poems, original and translated;' and in 1844, shortly before his death, a volume of translations of the 'Minor Poems of Schiller.'

MERLIN, or, more properly, MERDHIN. Some of the Welsh antiquaries speak of three Merlins: Merdhin Emrys, or Merlinus Ambrosius; Merdhin Wyllt, or Merlinus Caledonius, or Merlinus Sylvestris; and Merdhin ap Morvryn, otherwise called Merlinus Avolonius (from a poem ascribed to him, entitled 'Avallenau,' or the Orchard), and also known by the Latin names of Melchinus, Melkinus, and Mervynus. (Nicholson's 'Eng. Hist. Library.') It is generally agreed however that the second and third are the same person; and it is far from improbable that all the three Merlins are but one individual. Of Merlin Ambrosius the principal account we have is in Geoffrey of Monmouth's 'Historia Brittonum,' where he is represented as a great prophet and enchanter, who flourished in the time of King Vortigern, or about the middle of the fifth century. Of the Caledonian Merlin there is a life in Latin hexameters, by Geoffrey of Monmouth, who professes to have compiled it from an Armoric original; it is extant in one of the Cotton MSS. Collections of the Prophecies of Merlin have appeared in French, at Paris, 1498; in English, at London, 1529 and 1533; in Latin, at Venice, 1554; and there are also manuscripts of them, in French and English, in the Cotton and other libraries. The 'Avallenau,' and some other Welsh poems, attributed to Merdhin Wyllt, are published in the 'Welsh Archaiology,' 3 vols. 8vo., 1801, &c.

MERLIN, the English name for the *Falco Æsalon* of Linnæus · *Faucon de Roche* of the French; *Stein Falke* of the Germans; *Smerlio, Smeriglio*, and *Falchetto* of the Italians.

Merlin (*Falco Æsalon*).

This beautiful and daring little Falcon (the smallest of the British Falconidæ) is generally distributed through Europe. According to Dr. Richardson it occurs also in North America (Lakes Huron and Superior), and a closely allied species, if not the same, is found in South Africa. In our island it breeds on the moors of some of our northern counties, and according to Mr. Eyton, on Cader Iris in North Wales. [FALCONIDÆ.]

MERLU'CIUS, a genus of fishes, belonging to the *Gadidæ*, or family of Cod-fishes, distinguished by the possession of only two dorsal fins and one anal fin, and the absence of barbule on the chin. This latter character distinguishes the species of the genus *Merlucius* from the Burbots (*Lota*) and Rocklings (*Motella*), and there being only two dorsal fins removes the present genus from the more typical Cod-fishes, where there are three dorsal fins.

As a British example we may mention the Hake (*M. vulgaris*). (Yarrell's 'British Fishes,' vol. ii. p. 177.)

MERO'PIDÆ, a family of Fissirostral birds, of which the Bee-Eater (*Merops apiaster*) may be regarded as the type. [BEE-EATER.]

MEROVINGIANS. [FRANCE.]

MERRICK, JAMES, born in 1720, died in 1769. At the age of fourteen he published the 'Messiah, a Divine Essay,' and in 1739, at Trinity College, Oxford, he made a translation of the poem of Tryphiodórus on the Capture of Troy. He also published, in 1741, the Greek text of Tryphiodórus. He was chosen Fellow of Trinity College, Oxford, in 1744, and took holy orders. His chief works were, 'A Dissertation on Proverbs, ch. ix.;' 'Prayers for a Time of Earthquake and Violent Floods,' written in 1756, soon after the earthquake at Lisbon; 'An Encouragement to a Good Life, particularly addressed to some soldiers quartered at Reading;' 'Poems on Sacred Subjects' He made an excellent translation of the Psalms into English verse.

MERSEBURG, the most eastern of the three governments into which the Prussian province of Saxony is divided, has an area of 3994 square miles, with a population in 1847 of 724,686. The eastern and larger part of the government has in general a level surface, with gentle eminences, but no mountains; the western portion is more mountainous, being partly occupied by branches of the Harz mountains and the Thüringerwald: this portion however contains extensive and fertile levels, and the whole of the government, though the soil is unequal, may be called fertile. The principal rivers are the ELBE and its tributaries, the Schwarze Elster, on the right bank, the Mulde and the Saale on the left; the Saale receives the Elster and the Unstrutt. The government is traversed by the Magdeburg-Leipzic railway, which is joined at Halle by the Weimar-Halle line.

Merseburg, the chief town of the government, is situated on the Saale, 10 miles by railway S. by W. from Halle, and has about 10,000 inhabitants. It is an old irregularly built town, sur-

rounded with walls and entered by four gates. The most remarkable buildings are—a fine palace, now used for the government offices; the cathedral, which has one of the largest organs in Germany; the cathedral school; the monastery of St. Peter, in the suburb of Altenburg; the palace of Count Zechi; the military hospital; and the new town-hall. There are manufactories of various kinds, and extensive breweries and distilleries. The trade of Merseburg is considerable.

Dürrenberg, a small village between Merseburg and Lützen, has important salt-works, which produce about 40,000 tons of salt yearly.

Eilenburg, a town of 7700 inhabitants, stands N.E. of Merseburg, on an island in the Mulde, which is reached by two bridges. The town, which is surrounded by walls and ditches, has manufactures of printed cotton, vinegar, starch, brandy, woollen yarn, &c.

Eisleben, the birth-place of Luther, is situated 16 miles N.W. from Halle, on a hill above the Böse, and contains 4 churches, a gymnasium, several schools, 2 hospitals, and 7523 inhabitants, who are engaged in a brisk inland trade, in the manufacture of potashes and tobacco, and in the copper mines and smelting works of the neighbourhood.

Halle. [Halle.]

Naumburg, the midway station on the Weimar-Halle line, standing near the right bank of the Saale, a little above the point where that river is joined by the Unstrutt, is a well-built town, surrounded by walls which separate it from several suburbs. The chief buildings are the church of St.-Wendel, the court-house, the town-hall, and the gymnasium. This town is the seat of the court of appeal for the governments of Merseburg and Erfurt. It has about 12,000 inhabitants, who manufacture broad-cloth, linen, stockings, gloves, leather, starch, soap, vinegar, beer, brandy, and chemical products. Two great annual fairs are held here, one in June, the other in December, for the sale of all kinds of industrial produce; besides these three other annual fairs are held for the sale of horses and cattle.

Sangerhausen, a well-built walled town, situated at the foot of the Harz mountains, 31 miles N.W. from Merseburg, has 5133 inhabitants, many of whom are engaged in the copper mines and works near the town.

Torgau is a strongly fortified town, situated in a low marshy country on the left bank of the Elbe, which is here spanned by a bridge partly of wood and partly of stone. The population is about 7000; they manufacture woollen cloth, linen, leather, and soap, and trade in corn, timber, and lime.

Weissenfels, a town of 8000 inhabitants, 11 miles by railway N.E. from Naumburg, stands on the right bank of the Saale, which here becomes navigable, and is crossed by a wooden bridge. It is a walled town, entered by 4 gates, which lead to as many suburbs. On a rock outside the town stands an old castle, now used as barracks. A training house for schoolmasters, a gymnasium, an asylum for deaf mutes, 2 hospitals, and an almshouse, are the principal institutions of the town. Jewellery, porcelain, leather, and merino, are the chief manufactures. The remains of Gustav Adolf, king of Sweden, who fell at the battle of Lützen, are buried in the convent church now no longer used.

Wittenberg, a fortified town N.N.W. of Torgau, situated on the Elbe, which is here crossed by a wooden bridge 1000 feet long, is celebrated for its university, now suppressed, in which Luther was a professor in 1508. A colossal statue of Luther was erected in the market-place in 1817, and the university church contains the tombs of him and Melanchthon. The town has a theological seminary, a lyceum, several woollen and linen factories, breweries, distilleries, dyehouses, and 8500 inhabitants, who are also engaged in gardening and in the Elbe fisheries. The university of Wittenberg has been incorporated with that of Halle.

Zeitz, a walled town entered by 6 gates, built on the slope of a steep hill, on the right bank of the Elster, 18 miles S.E. from Naumburg, contains a fine old castle, called Moritzburg, 4 churches, a lyceum, a library of 12,000 volumes, several schools, and about 10,000 inhabitants, who manufacture calico, broad cloth, leather, starch, beer, spirits, pottery, gloves, ribands, &c.

MERSENNE, MARIN, a very learned philosopher and mathematician, was born in 1588 at Oyse, in the present department of Maine, and received his education at the college of La Flèche. He afterwards studied at the university of Paris, and subsequently at the Sorbonne. In 1612 he took the vows at the convent of the Minimes, in the neighbourhood of Paris, and the year following received ordination as priest. In 1615 he filled the chair of philosophy at Nevers, and there taught till the year 1619, when he was chosen superior of the convent, and on completing the term of his office he travelled into Germany, Italy and the Netherlands. He finally settled in Paris where his gentle temper and his polite and engaging manners procured him a number of distinguished friends. Of these the chief was Descartes the founder of the Cartesian philosophy. He died at Paris in 1648. The Père Mersenne was undoubtedly a man of great learning and unwearied research, and deserved the esteem in which he was held by the philosophers and literati of his age; but, except his 'Harmonie Universelle,' his works are now unread and almost unknown.

MERSEY. [Cheshire; Lancashire.]

MERTHYR TYDVIL. [Glamorganshire.]

MERTON COLLEGE, Oxford. This college was first founded at Malden in Surrey, in 1264 by Walter de Merton, bishop of Rochester and chancellor of England, who in 1274 removed it to Oxford.

The foundation at present consists of a Warden, 24 Fellows, 14 Post-Masters, 4 Scholars, 2 Chaplains, and 2 Clerks. The buildings of this college consist of three courts; the outer one, towards the street, was rebuilt in 1589, except the tower and gate, which are of the 15th century. The chapel, at the west end of the outer court, is also a parish church, dedicated to St. John the Baptist. It contains, among other monuments, that of Sir

Thomas Bodley. The number of members on the books of this college, Jan. 1848, was 169.

MERU'LIDÆ, a family of birds embracing the Blackbirds, Thrushes, Dippers (*Cinclus*), Orioles (*Oriolus*), Pittas (*Pitta*), Rock-Thrushes (*Petrocincla*), and other dentirostral genera. Mr. Vigors places this family between the *Laniadæ* or *Shrikes*, and the *Sylviadæ* or *Warblers*.

MERU'LIUS, a genus of Fungi, deriving its name from *Merula*, a blackbird, some of the species being black. The only known means of preventing the attacks of this and other fungi upon timber is a free circulation of dry air, or the impregnation of the wood with corrosive sublimate.

MERVILLE. [Nord.]

MESEMBRYA'CEÆ, a natural order of Polypetalous Exogens, consisting of plants inhabiting various parts of the world, in very dry temperate climates, but especially the Cape of Good Hope, where the species are extremely numerous. The common Ice-Plant of the gardens, *Mesembryanthemum crystallinum*, so called because its cuticle is elevated in the form of multitudes of crystalline points, is burnt in the Canaries for the sake of its ashes, from which Barilla is made.

MESENTERY is the membrane by which the intestines are attached to the posterior wall of the abdomen. It consists of a double layer of fine cellular and adipose tissue, which is attached to the abdominal wall by a comparatively narrow origin, and becoming gradually wider, spreads out like a fan, to be attached to the whole length of the canal of the small intestines. Between its layers the arteries pass to the intestines, and the veins and lacteals return from them.

MESMERISM. [Animal Magnetism.]

MESOLO'NGHI, or MESSOLO'NGHI, perhaps the ancient *O'lenus*, in Aetolia, a small town in Greece, lies on the northern side of the Gulf of Patras, near its entrance, and right opposite Cape Kologria, or Papas, in the Morea. It became remarkable during the last Greek insurrection against the Turks, in consequence of the siege and capture of it by Ibrahim Pasha, the commander-in-chief of the besiegers. The heroic resistance of the Greek garrison, and their ultimate fate, made the name of Mesolonghi popular over all Europe.

MESOPOTA'MIA, is a Greek word which means 'a tract between rivers.' Mesopotamia is called in the Old Testament *Aram-naharaim*, that is 'Aram,' or 'Syria between the two rivers,' and is the ancient name of the country lying between the Tigris and Euphrates. It was bounded on the N. by Mount Masius (*Karajeh Dagh*), a branch of Mount Taurus, and on the S. by the Median wall and the canals which connected the Tigris and Euphrates, by which it was separated from Babylonia. The name of Mesopotamia, which was never employed to designate any political division, did not come into use till after the time of the Macedonian conquest of Asia. It is called by the Arabs in the present day *Al Jezireh*, 'the island.'

Mesopotamia may be divided into two parts. The northern part, from Mount Masius to about 35½° N. lat., is a fertile country watered by the Chaboras and the Mygdonius; the southern part, from the neighbourhood of Circesium to the Median wall, is a flat and desert country, which Xenophon has described in the 'Anabasis,' (i. 5). The northern part of Mesopotamia was divided into two parts by the river Aborras or Chaboras (*Khabour*), called Araxes by Xenophon, which rises in Mount Masius, and receiving the Mygdonius (*al Huali*) on the E., flows into the Euphrates at Circesium. Of these divisions the western was called Osroene, and the eastern Mygdonia.

The chief town of Mygdonia was Nisibis, also called Antiochía Mygdonica (*Nisibin*), situated on the river Mygdonius, in a fertile plain at the foot of Mount Masius.

The chief town of Osroene was Edessa (*Orfa*), in the north-west of the province, nine geographical miles from the Euphrates. Two days' journey, according to Niebuhr, south-east of Orfa, was the ancient town of Charræ (*Harran*), the Haran of the Scriptures, where Abraham's family dwelt after they had left Ur of the Chaldees. Charræ is memorable in Roman history for the defeat of Crassus.

Circesium (*Kerkesiah*), at the union of the Euphrates and Aborras, was a very ancient town: it is called Carchemish in the Old Testament. A little to the north of Circesium, near Thápsacus, was an ancient ford across the Euphrates.

ME'SPILUS, a genus of plants belonging to the natural order *Rosaceæ*, and to the sub-order *Pomeæ*. The species are trees, natives of Europe, and in a wild state are furnished with spines, which all disappear on cultivation. *M. Germanica*, the common Medlar, is a native of Europe and Siberia. It is found in Great Britain in hedges and thickets, in Surrey, Sussex, and Cheshire. It is cultivated on account of its fruit, which is eaten in a state of decay. Its taste and flavour are peculiar, and greatly esteemed by some persons. [Fruit.]

MESSALINA. [Claudius Nero.]

MESSALLA, or with his full name, MARCUS VALERIUS MESSALLA CORVINUS, was born B.C. 59, in the same year as Livy. He was opposed to the party of Antonius and Octavianus (Augustus), and was included in the proscription of the second triumvirate, B.C. 43; but, after the battle of Philippi, he made his peace with the conquerors, and was advanced by Augustus to offices of great trust and power. He was consul B.C. 31. He died about A.D. 11.

Messalla was one of the most celebrated orators of his time, and a great patron of literature.

MESSENGERS AT ARMS are the officers who execute the writs issuing from the supreme courts in Scotland.

MESSENGERS, KING'S or QUEEN'S, certain officers employed under the secretaries of state, who carry despatches both at home and abroad.

MESSE'NIA, a country of ancient Greece, was bounded on the E. by Laconica, on the N. by Elis and Arcadia, and was surrounded by the sea on the western and southern sides. It was separated from Laconica by the mountain chain of Taygetus;

and from Elis and Arcadia by the river Neda and the high land which runs between the bed of the Neda and the sources of the Pamisus. Its area is calculated by Mr. Clinton at 1162 square miles, which is about the area of Staffordshire.

Messenia is described by Pausanias as the most fertile province in the Peloponnesus. The western part of Messenia is drained by the river Pamisus, which rises in the mountains between Arcadia and Messenia, and flows southward into the Messenian bay (Gulf of Koroni). The basin of the Pamisus is divided into two distinct parts. The upper part, usually called the plain of Stenyclérus, is of small extent and moderate fertility; but the lower part south of Ithóme is an extensive plain, celebrated in ancient times for its great fertility, whence it was frequently called *Macaria*, or the 'Blessed.' Leake describes it as covered in the present day with plantations of the vine, the fig, and the mulberry, and 'as rich in cultivation as can well be imagined.' ('Travels in the Morea,' i., p. 352.) The western part of Messenia is diversified by hills and valleys, but contains no high mountains.

On the division of the Peloponnesus, after the Dorian conquest under the Heraclidæ, Messenia fell to the share of Cresphontes, who fixed his capital in Stenyclerus, and divided the country into five districts. Pylus however appears to have retained its independence till a much later time. The history of Messenia belongs to the general history of Greece, and is particularly connected with that of Sparta.

The chief towns on the western coast were Pylos and Mothóne, or Methóne (*Modon*). The bay of Pylos (*Navarino*), which is protected from the swell of the sea by the island of Sphacteria (*Sphagia*), is the best harbour in the Peloponnesus.

The only town inland of any importance was Messene, at the foot of Mount Ithome, on the summit of which was the citadel. Strabo speaks of this citadel and of Acrocorinthus as the two strongest places in Peloponnesus; and the account of Pausanias, who praises the strong fortifications of the town, is confirmed by the solid and beautiful masonry which remains to the present day.

MESSIAH is a Hebrew word, of the same signification as the Greek Χριστός (Christ) *anointed*. In the Old Testament the word is repeatedly applied to persons who were consecrated to the service of God in some sacred office. Thus the Jewish priests, prophets, and kings are called *anointed* (Messiah), or *the anointed of God*. From this general meaning the word has passed into a particular use, referring to the illustrious personage whom the ancient Jews expected, and whom their descendants still expect, to confer some signal blessings on their nation and the world. The word is found in this sense twice in the Old Testament. (Psalm ii. 2, and in Daniel, ix. 25, 26.)

The belief of the ancient Jews respecting the person and office of the Messiah is derived from the passages of the Old Testament which are understood as predictions concerning him. An elaborate examination of all such passages occupies the 4th chapter of the 2nd book of Dr. Smith's 'Scripture Testimony to the Messiah.'

At the time of Christ's advent various expectations respecting the Messiah prevailed among the Jews. It is sufficiently evident from the New Testament, that, while some looked for a human prince who was to deliver them from the Roman yoke and exalt them to national supremacy, others expected a divine teacher, who was to confer spiritual blessings not only upon them but also on the Gentiles. The opinion of the Samaritans recorded in John, iv. 42, that the Messiah would be a religious teacher and 'the Saviour of the world,' is worthy of special attention, because the Samaritans received no part of the Scriptures but the Pentateuch, and were cut off from all intercourse with the Jews by national hatred.

It is the belief of all Christians that Jesus Christ is the Messiah predicted in the Old Testament. The evidence of this fact is contained in the New Testament, especially in the four gospels, from which it appears that his lineal descent, the place, time, and other circumstances of his birth, the constitution of his person, the history of his life and death, the miracles he performed, and the doctrines he taught, all agree to the minutest particular with the prophecies respecting the Messiah.

MESSINA, the north-eastern province of Sicily, is bounded W. by the province of Palermo, S. by that of Catania, N. by the Mediterranean, and E. by the Faro or Strait of Messina. The area of the province is 1386 square miles, and the population in 1845 was 349,183. A continuation of the mountainous ridge that crosses Sicily from W. to E. covers the greater part of the surface, and terminates in Cape Pelorus. The streams are numerous, but short; in summer, nearly dry, during the rainy season, torrents. The province contains many beautiful and fertile valleys. Its chief products are wine, oil, and fruit of every sort. Among the chief towns of the province are those that follow:—Messina. *Melazzo*, the ancient Mylæ, a seaport town on a promontory of the northern coast facing the Lipari islands, stands 15 miles west of Messina, and has a castle and 7000 inhabitants, many of whom are employed as sailors and fishermen. *Patti*, on the same coast, 15 miles south-west of Melazzo, has several churches and convents, and between 4000 and 5000 inhabitants. *Taormina*, the ancient Tauromenium, on the east coast, an old looking town with about 4000 inhabitants, is built upon a steep cliff towering above the sea; it has an ancient theatre and other ruins scattered around. *Castro-Reale*, in a valley rich in oil and wine, has 12,000 inhabitants. *Randazzo*, at the north base of Ætna, in a very fertile district, on the right bank of the Alcantara, has 4500 inhabitants. *Mistretta*, in the most western part of the province, has a population of 8000.

The islands of Lipari are included in the administrative province of Messina. [Lipari Islands.]

MESSINA (the ancient *Zancle* and *Messana*) the chief trading town and port of Sicily, lies on the north-east coast of the island. The town is built partly on a declivity, and partly on the

sea-shore. The larger part of it rises in the form of a crescent on the west side of the harbour, along which there is a fine quay lined by a handsome row of buildings. The remarkable buildings are—the cathedral, the churches of La-Candelara and the Capuchins, which contain some fine pictures; the Greek church of Santa-Maria; the royal palace; the archiepiscopal palace; the arsenal, the loggia, the bank, and the public library. Messina gives title to an archbishop; it has a provincial court of appeal, a commercial tribunal, a royal college, and about 60,000 inhabitants. The port is formed by a strip of sandy beach projecting into the sea south of the town, and sweeping into a semicircle. The harbour, which is more than 2 miles in circumference, is one of the best in the Mediterranean. The chief exports are oil, currants, raisins, wine, almonds, lemons, sumach, lamb-skins and kid-skins, and liquorice: the chief manufacture is silk. Great damage was done to the city in 1848, when it was taken by the Neapolitan troops, after a bombardment of 5 days, on the 7th of September.

MESTA, a Spanish word which commonly means a mixture of two or more kinds of corn, but is applied in a particular sense to the union of the sheep of several proprietors in one collective body: of the custom denoted by this particular application of the term, the present article treats. The vast tracts thrown out of cultivation, and left unoccupied after the expulsion of the Moors from Estremadura in the 13th century, were soon clothed by nature with rich pasture, which attracted the attention of the upland shepherds of Leon and Castile, who drove their flocks thither to milder winter quarters. The great plague of 1348, which swept away two-thirds of the population of Spain, left many more unclaimed and uninhabited lands in most of the provinces of Spain, and on these also the restless flocks soon encroached. On this custom of migratory pasturage, originating in usurpation, in circumstantial necessity, or in both, the proprietors of the flocks, who have always included the great nobles, conventual and other ecclesiastical corporations, and persons in power, founded a claim, which long possession converted into a prescriptive right, so that the mesta has been long an institution of Spain, regulated by a special code, and guarded by its own judges and courts of law. The number of these migratory sheep at the beginning of the present century amounted to about five millions. In the month of April the flocks leave the plains of Andalucia and Estremadura for the cooler pastures of Leon, the two Castillas, and Aragon, whence they begin to return southwards in October; for the lands depastured during the winter months a low price is paid, regulated by usage, and on which no advance is allowed. The sheep are divided into flocks of 10,000, each managed by a conductor, who has under him 50 shepherds and as many dogs. They pass unmolested, and feed over the pastures and commons that lie on their road; they are not allowed to traverse cultivated lands, but the proprietors of such lands are obliged to leave a clear space, 85 yards wide on each side of the road, for the passage of the flocks. At night they are penned in with nettings made of the esparto rush. The different routes and the length of each day's journey in these migrations are fixed by immemorial usage. Lambing takes place during the winter sojourn in the south. The sheep-shearing commences in May on the northward journey, and is effected in vast buildings by the road side, called *Esquileos*, capable of containing 50,000, and some of them 60,000 sheep; the principal of these buildings are in the environs of Segovia.

The Spanish sheep are descended from a cross between the famous Baetican breed and a flock of English sheep sent over with John of Gaunt's daughter, Catherine, on her marriage with the heir of Enrique III., King of Castile. These are said to have been called *marinos* from having come over the sea, and hence by corruption came the name *merinos*. The wool of the sheep belonging to the mesta is celebrated for its fineness, length of fibre, and silky softness; this excellence is said to be owing to the habits of the sheep, whereby they are led to live in almost always the same temperature. The carcass of the mesta sheep is bad; indeed they are prized only for the fleece; after five years they are useless, having then lost their teeth. The sheep know of themselves when to go northwards, and when to return to the south; and if not led on will set out of their own accord. They are always on the move (except when penned for the night), and from this circumstance they are distinguished from the stationary sheep of Spain by the name of *trashumantes*, or wanderers.

The mesta is very unpopular in Spain, for the following among other reasons—the number of persons (40,000 or 50,000) whom it takes from the cultivation of the soil; the immense extent of valuable land kept out of cultivation; the continual trespass on the cultivated lands near the route taken by the flocks in their migration; the scarcity of food for the stationary sheep in the line of march of the trashumantes; the loss in an agricultural point of view of the sheep never being penned on arable land; and the despotic behaviour of the shepherds, who are protected in their improper privileges and conduct by the tribunal of the mesta. A committee was formed about the middle of the last century to inquire whether the mesta ought to be maintained or suppressed; but, though permanently established, it decided nothing. In the cortes of Cadiz in 1811-12, the mesta was abolished; it was re-established in 1814 by Ferdinand VII.

METAGALLIC ACID is a black, shining, tasteless compound, not dissolved by water, but easily taken up by the alkalis ammonia, potash, and soda, in solution. It consists of $O^3\ H^3\ C^{12}$.

METALLURGY is the art of separating metals from their ores. The processes vary for every metal.

METALS. The metals form a numerous and highly important class of simple or elementary bodies. They amount in number to upwards of 40. They are, given alphabetically, as follows:—aluminum, antimony, arsenic, barium, bismuth, cadmium, calcium, cerium, chromium, cobalt,

columbium, copper, glucinium, gold, iridium, iron, latanium, lead, lithium, magnesium, manganese, mercury, molybden, nickel, osmium, palladium, platina, potassium, rhodium, silver, sodium, strontium, tellurium, thorium, tin, titanium, tungsten, uranium, vanadium, yttrium, zinc, zirconium. Some chemists rank selenium and silicium also among the metals, and a few newly-discovered metals are now undergoing examination.

The metals, with the exception of mercury, are all solid at the usual temperature of the air, and the colour of most of them is grayish white. The lustre of metals is great and peculiar, and is well known by the name of the metallic lustre; they differ however very considerably in the degree in which they possess this property. When reduced to a state of minute division, the metallic lustre is lost, but the colour remains. The metals are generally reckoned perfectly opaque, even when reduced to thin leaves; but it is found that gold-leaf, which is $\frac{1}{200000}$ part of an inch thick, suffers light to pass through it, and it has a green colour; it is therefore extremely probable that all metals, if they could be rendered equally thin, would also be translucent. There are some metals, such as lead, tin, copper, and iron, which, when rubbed, emit a peculiar and disagreeable smell; and others, such as arsenic and antimony, which emit an odour when heated. All the metals are heavier than water, except sodium and potassium. Platinum is the heaviest. About one half of them are ductile or malleable, and the other half brittle. Gold is the most ductile and the most malleable, iron is the most tenacious, and titanium the hardest, in their native state. The elasticity and sonorousness of metals are generally associated with their degree of hardness. There are not however any metals which are by themselves either very elastic or sonorous; but there are alloys which possess these properties in a high degree, as for example those of copper and tin.

The structure of metals is sometimes lamellar, sometimes granular, and frequently crystalline: indeed, some of them, and more especially copper, occur crystallised in the form of the cube and its varieties. Bismuth is a metal which may be artificially crystallised in cubes with great facility.

As to the action of the imponderable bodies upon the metals, it must be premised that no particular effect has been attributed to the agency of light. The metals are good conductors of heat; some of them rank in the following order in this respect—gold, silver, platina, copper, iron, zinc, tin, lead. Their capacity for heat ranges them in a different order, bismuth and lead taking the lead. Immediately that heat pervades the metals, and before it fuses them, it expands them in all directions. This dilatation is different in different metals; it varies also in the same metal with every degree of the thermometric scale; but from the freezing to the boiling point of water it may however be regarded as nearly constant. The fusing point of metals varies extremely. [Freezing and Melting Points.]

Metals differ in volatility. Some metals are volatilised at moderate degrees of heat: among these are mercury, cadmium, arsenic, tellurium, zinc, potassium, and sodium; but there are others which may be exposed to the most intense heat of a wind furnace without being at all vaporised.

Becquerel has given the following order of the relative conducting powers of the metals for electricity:—copper, gold, silver, zinc, platina, iron, tin, lead, mercury, potassium. According to Pouillet, each of the following metals is positive with relation to that which follows it:—zinc, lead, tin, iron, antimony, bismuth, copper, mercury, silver, gold, tellurium, palladium, platina. There are two metals only which are capable of being rendered permanently magnetic, namely, iron and nickel; the former of these only is met with possessing this property in nature; it is an oxide of iron, and commonly called the *loadstone*. Most of the metals combine with each other and form compounds differing very materially in properties from their constituent metals. [Alloys.] All metals unite with oxygen, but with different degrees of facility and affinity; most of them combine with more than one proportion of oxygen and some of them with several proportions. A few of these compounds form acids, but most of them oxides. Hydrogen, chlorine, bromine, sulphur, iodine, and phosphorus, all combine with some or other of the metals. Some metals, as potassium, sodium, and manganese, decompose water even at common temperatures, combining with its oxygen and evolving the hydrogen; others, as iron and zinc, require to be strongly heated, or the presence of an acid, to effect this decomposition.

Although most metals are dissolved by acids, yet platina and gold are exceptions to it, these and some others requiring chlorine, and generally in the nascent state called *aqua regia*.

METAMORPHOSIS OF PLANTS. [Vegetable Morphology.]

ME'TAPHOR (*μεταφορά*, literally 'a transference'), a figure of speech which renders the subject of discourse striking, by the aid of expressions primarily referring to other objects. A common kind of metaphor is Personification, by which inanimate beings are represented as endowed with life, with feeling, reason, &c., as 'the fields do laugh and sing,'—'stern winter.' This kind of metaphor spiritualises the corporeal; another kind embodies the spiritual, as 'the star of renown,'—'the pinnacle of honour.' In a third kind two objects are brought together, only on account of their resemblance. To this kind belong such expressions as 'the silver moon'—'the golden sun,' &c., where 'silver' and 'moon,' 'gold' and 'sun,' are connected merely on account of their similarity of colour and brightness. The application of certain metaphors, in all languages and among all people, attracted the attention of Jean Paul Richter, who remarked that 'no nation called error light, or truth darkness.' A great part of the commonest discourse is composed of metaphors of the second kind, and nearly all words expressing mental states, operations, and affections are metaphorical. Thus we say 'a man of extended views'—'a man of good capacity, acute judgment,' &c., where the words 'extended,' 'views,' 'capacity,' 'acute,' evidently belonged

originally to material objects, but have been applied to things immaterial by metaphors.

METAPHYSICS, a name originally applied to those books of Aristotle which followed his 'Physics,' and which his editors called 'the book after the physics' (*μετὰ τὰ φυσικά*). In modern times the word has been variously applied. With the Germans metaphysics is a science purely speculative, and the objects of this science are supersensual ideas, unattainable by experience. The very possibility of a science beyond experience has been denied by numerous philosophers, and many works called metaphysical should rather be termed inquiries into the possibility of metaphysics. Thus Kant's celebrated work, the 'Critik der reinen Vernunft,' is a mere inquiry into the possibility of a theoretical science of things beyond experience, which terminates with a denial of such possibility, and hence some modern philosophers have considered Kant as no metaphysician, but as a critic of the mental faculties, whose labours were to be the precursors of a new system of speculation. Those who deny the possibility of metaphysics deny even the right to assume any axioms as applicable to a sphere beyond experience; and those who did assume them, as Spinoza, Leibnitz, and Wolf, were called by the Kantians dogmatists, in opposition to their own appellation of critics.

In England, the word metaphysics is usually applied to denote the philosophy of mind. This science treats of the association of ideas, memory, and various phenomena of mind; and as it consists merely in collecting facts and making inductions like any other experimental science, its possibility is no more questionable than that of chemistry or electricity. The philosophy of mind as an experimental science has been chiefly treated by the modern Scotch philosophers.

METASTA'SIO, PIE'TRO, was born at Rome, Jan. 6, 1698. His father's name was Felice Trapassi. Before he was ten years old, says his biographer, Dr. Burney, he could make verses on any subject. Gravina was forcibly struck with the youthful improvvisatore, and adopted him, changing his name to Metastasio (*μετάστασις*, a changing). Gravina educated his charge for the profession of the law, but caused him to study the ancient poets, in which pursuit his ardour and success were so great, that at the early age of fourteen he produced his tragedy 'Giustino,' written after the Greek models. His patron now encouraged his devotion to the muses; and when Metastasio had reached his 18th year, Gravina accompanied him to Naples, that he might meet and sing with the most eminent improvvisatori of the day. He became a universal favourite. Still he continued to study the law; and, to secure an opening into the only other road to preferment, entered into a minor order of priesthood. Within two years after his arrival at Naples, his patron died. By Gravina's will he became sole possessor of 15,000 crowns, a fine library, and a little estate in the kingdom of Naples. But such was the extravagance of the poet, that, in two years, all that remained to him was the small estate. He now applied to the law, and for a year was assiduous in his studies, but at the end of that time he was again attracted to his poetic pursuits, and produced the drama of 'Endimione.' Under the patronage of the viceroy of Naples he next produced 'Gli Orti Esperidi' and 'Angelica.' The former was especially admired by Signora Bulgarini, and such were her admiration and esteem for the author, that she persuaded him to renounce the law, to take up his abode under her husband's roof, and to dedicate the whole of his energies and time to the muses. His 'Didone Abbandonata' was much admired, and was set to music by all the great Italian composers of that period. In 1727 he accompanied Signora Bulgarini to Rome, where he produced his 'Semiramide,' 'Ezio,' 'Alessandro nell' Indie,' 'Catone in Utica,' and the opera so well known by our English version of it, 'Artaserse.' In the year 1729 Metastasio received an invitation from the court of Vienna, whither he repaired, and became the successor of Apostolo Zeno, the Imperial laureate. During his residence in Vienna he produced many other lyrical dramas, besides seven sacred dramas, or oratorios. He also wrote numerous short dramatic pieces, sonnets, and other miscellaneous works. He died at Vienna, April 12, 1782.

METELLI, a distinguished family of the Cæcilian *gens* in ancient Rome.

1. *Q. Cæcilius Metellus Macedónicus* was sent when prætor (B.C. 148) into Macedonia against Andriscus, who pretended to be a son of Perseus, the last king of Macedonia, and who had excited a revolt against the Romans. Andriscus was defeated and taken prisoner by Metellus. In B.C. 146 Metellus defeated the Achæans near Thermópylæ, and on his return to Rome obtained a triumph for his conquest of Macedonia. Metellus in his consulsip B.C. 143 was sent into Spain to oppose Viriathus. Metellus remained in Spain two years, and obtained several victories, but was succeeded in the command, before the conclusion of the war, by Q. Pompeius.

Pliny cites Metellus as an extraordinary example of human happiness. 'For besides the possession of the highest dignities,' says Pliny, 'and having obtained a surname from the conquest of Macedonia, he was carried to the funeral pile by four sons, of whom one had been prætor, three had been consuls, two had enjoyed a triumph, and one had been censor.' ('Hist. Nat.,' vii. 45.)

2. *Quintus Cæcilius Metellus Numidicus* derived his latter *cognómen* or surname from his victories in Numidia, whither he was sent in his consulship, B.C. 109, to oppose Jugurtha. He remained in Numidia, B.C. 108, as proconsul; but in the beginning of the following year he was superseded in the command by Marius, who had formerly been his *legatus*, or lieutenant-general. On his return to Rome Metullus obtained the honour of a triumph.

Metellus was censor B.C. 102. He took an active part in the civil commotions of his time, and was one of the most powerful supporters of the aristocratical party.

3. *Q. Cæcilius Metellus Pius*, son of Numidicus, belonged to the same political party as his father, and supported Sulla in his contest with Marius.

Metellus received especial marks of favour from Sulla, and was consul with him B.C. 80. In B.C. 78 Metellus was sent against Sertorius in Spain, where he appears to have remained till the conclusion of the war, in B.C. 72. From the year 76 Pompeius was his colleague in the command; and they triumphed together at the end of the war. [SERTORIUS.] Metellus was Pontifex Maximus; and on his death, B.C. 63, he was succeeded in that dignity by Julius Cæsar.

METEMPSYCHO'SIS (*μετεμψύχωσις*), derived from a Greek word signifying the passage or transmigration of souls, forms a part of the philosophical or religious belief of the Hindoos. The migration of souls from one body to another also formed a leading feature of the Pythagorean doctrine. This doctrine was also a part of the Egyptian religious system. (Herodotus, ii. 123.)

METEORIC STONES, or *Aërolites*, are bodies which have fallen upon the earth from the atmosphere, and are named from *ἀήρ* (*aer*), atmosphere, and *λίθος* (*lithos*), a stone. The fall of stones from the atmosphere was known to the Greeks; but the first man of science in modern times who directed attention to the subject of aërolites was Chladni, a German philosopher, who, in a tract published at Riga and Leipzig, in 1794, upon the mass of native iron found by Pallas in Siberia, maintained the credibility of the traditions of that and other stony bodies having fallen from the air. From that time greater attention than before was paid to the popular accounts of meteoric stones. In 1796, a stone was exhibited in London, weighing fifty-six pounds, which was said to have fallen in Yorkshire, in December of the preceding year. In the year 1799, Sir Joseph Banks received a circumstantial account, accompanied by specimens, of a fall of stones from the atmosphere, which was said to have taken place near Benares, in the East Indies, in the preceding December; and, as these specimens were nearly identical with the Yorkshire stone, incredulity began to give way. It was not however until the appearance of a paper by Howard, in the 'Philosophical Transactions' for 1802, giving an account of his analysis of the Benares stone, that men of science declared their belief in the phenomenon.

A detailed description of one very remarkable shower of stones will illustrate the subject generally. On the 26th of April, 1803, at one o'clock in the afternoon, the sky being clear, with the exception of a few light clouds, a ball of fire was observed in Normandy, in many places far distant from each other—namely, Caen, Falaise, Alençon, Verneuil, and Pont Audemer, which moved rapidly from south-east to north-west; and about the same time, in the district of L'Aigle, loud explosions were heard, which lasted from five to six minutes, resembling the sound of cannon and musketry, and were followed by a long-continued noise, like that of many drums. The meteor from which the noise proceeded appeared not so much like a ball of fire, but rather like a small rectangular cloud, which, during the phenomenon, seemed not to move; but the vapour of which it consisted, was sent out, after each explosion, in all directions. It seemed to be about half a league north-west from L'Aigle, and must have been at a very considerable elevation, as it appeared to the inhabitants of two villages more than a league distant from each other, to be immediately over their heads at the same instant. Throughout the whole district over which the cloud hung, there was heard a hissing noise, like that of a stone from a sling, and a vast number of stones fell to the ground. The space on which they fell formed an ellipse of two leagues and a half long by one broad, the largest diameter being from south-east to north-west, the direction in which the meteor moved: the largest stones were found at the south-east end of the ellipse, and the smallest at the opposite extremity. Above two thousand were collected, and they varied in weight from two drams to seventeen pounds and a half.

Aërolites, when taken up soon after their fall, are extremely hot. They are generally angular, of prismatic and pyramidal forms, the angles being rounded; their broken irregular surface is coated with a fused black crust, like varnish, seldom exceeding $\frac{1}{10}$th of an inch, or a quarter of a line, in thickness. When broken, they differ a little in appearance; but they are, for the most part, composed of a collection of small spherical bodies, of a gray colour, imbedded in a gritty substance, and often interspersed with yellow spots. One of the most remarkable circumstances is the great similarity of composition of all the meteoric stones, on whatever part of the earth they have fallen. Iron, nickel, silica, magnesia, and sulphur, are the chief ingredients, especially iron; but the earths, alumina and lime, the metals manganese, chrome and cobalt, together with carbon, soda, and water, have also been found in minute and variable quantities. No new substance, nothing with which we were not already acquainted, has ever been discovered in their composition.

Chladni has compiled a very copious catalogue of all recorded instances, from the earliest times: of which twenty-seven are previous to the Christian æra; thirty-five from the beginning of the first to the end of the fourteenth century; and eighty-nine from the beginning of the fifteenth to the beginning of the present century. Within the last fifty years, a vast number have been recorded. But the actual number must greatly exceed the recorded instances. Livy, Plutarch, and Pliny, all speak of meteoric stones which had fallen in ancient times.

Besides aërolites properly so called, masses of malleable iron, often of vast size, have been found in situations, which, together with their composition, leave no doubt as to their being of meteoric origin. An immense mass, seen by Pallas in Siberia, was found quite insulated, at a great elevation, on a mountain of slate near the river Yenesei, removed from everything that could excite suspicion of its being a production of art, and totally different from any ore of iron seen either before or since that time. The mass, which weighed about 1400 lbs., was of an irregular form, not solid, but cellular like a sponge, the

cells containing small granular bodies of a glassy nature, afterwards found to be the simple mineral olivine, so common in basalt. Another vast mass of meteoric iron was found in South America in 1788, about 500 miles north-west from Buenos Ayres. It lay in a vast plain of above a hundred leagues in extent, half sunk in the ground, and the size was such as, estimating it by the specific gravity of iron, would give a weight of more than thirteen tons. According to the analysis of Proust and of Howard, it contains 90 per cent of iron, and 10 of nickel. Another mass was found in Brazil, about fifty leagues from Bahia, the weight of which was estimated at 14,000 lbs. Many other instances of similar masses of iron might be mentioned, which are evidently of meteoric origin; but the only instance on record of iron having been actually seen to fall from the atmosphere, is that which took place at Agram, in Croatia, in 1751. On the 26th of May, about six o'clock in the evening, the sky being quite clear, there was seen a ball of fire, which shot along with a hollow noise from W. to E., and after a loud explosion, accompanied by a great smoke, two masses of iron fell from it, in the form of chains welded together.

Aërolites and meteoric iron are not the only products of meteors which have fallen upon the earth after explosion. Numerous instances are mentioned of black and red dust, which has covered great tracts of land; and of the fall of a soft gelatinous matter of a red colour like coagulated blood, which may have given rise to stories of the sky having rained blood. Such appearances have not unfrequently accompanied the fall of stones.

The origin of this remarkable class of natural phenomena is involved in great obscurity, and many different theories have been proposed to account for them. By some they have been supposed to be bodies ejected from distant volcanos belonging to our earth. Another hypothesis is, that meteoric bodies are formed in the atmosphere. A third hypothesis is, that they are bodies thrown out by the volcanos which are known to exist in the moon, with such force as to bring them within the sphere of the earth's attraction. But the theory which is most consistent with all known facts and laws of nature is that proposed by Chladni, viz., that the meteors are bodies moving in space, either accumulations of matter as originally created, or fragments separated from a larger mass of a similar nature. Davy remarks, 'The velocity of motion of these bodies must, in all cases, be immensely great, and the heat produced by the compression of the most rarefied air from the velocity of motion must be probably sufficient to ignite the mass; and all the phenomena may be explained, if *falling stars* be supposed to be small solid bodies moving round the earth in very excentric orbits, which become ignited only when they pass with immense velocity through the upper region of the atmosphere, and if the *meteoric bodies* which throw down stones with explosions be supposed to be similar bodies which contain either combustible or elastic matter.'

The latest views on this subject regard meteors rather as being planetary than mere satellites of the earth. Humboldt says ('Cosmos,' ch. 1), 'Shooting stars, fire-balls, and meteoric stones are, with great probability, regarded as small bodies moving with planetary velocity, and revolving in obedience to the laws of general gravity in conic sections round the sun. When these masses meet the earth in their course, and are attracted by it, they enter within the limits of our atmosphere in a luminous condition, and frequently let fall, more or less strongly heated, stony fragments, covered with a shining black crust.' The fire-balls, which are occasionally seen to shoot across the sky, have been estimated at from 500 to 2800 feet in diameter; their height, when visible from the earth, at from 16 to 140 miles; and their velocity of motion at from 18 to 36 miles in a second. The regular recurrence of shooting stars, about the middle of the months of August and November of each year, is considered to confirm this astronomical view of the origin of meteorolites; and different days throughout the year have been marked as distinguished by these phenomena, as if there were streams of these small bodies near the earth, on those days. Humboldt's final views may be gathered from the following:—'The different meteoric streams, each of which is composed of myriads of small cosmical bodies, probably intersect our earth's orbit in the same manner as Biela's comet. According to this hypothesis, we may represent to ourselves these asteroid-meteors as composing a closed ring or zone, within which they all pursue one common orbit.'

METEOROLOGY, in its extended sense, embraces all physical causes which affect the state of the atmosphere or are affected by it. Hence it is connected with the phenomena of heat and cold, dew, rain, hail and snow, clouds, winds, auroræ boreales, haloes, parhelia, &c. The air, though composed of several elastic fluids, obeys the same laws to which they are individually subject, namely, its elasticity and density at a given temperature are proportional to the pressure which it sustains, and for every degree of the centigrade thermometer under a given pressure it expands $\frac{3}{800}$ of its volume at the temperature zero. Heat increases the elastic power of air, and hence the equilibrium of a mass of air unequally heated is constantly disturbed. The currents of warm and cold air change places, the cold air moving to the warm region, and thence, when warmed, repeating the course of the previous warm air. Thus the atmosphere is a great agent in *tending* to equalise the mean temperatures of climates in various latitudes. Besides, the aërial currents are vehicles for the transfer of clouds, for producing electrical discharges, and for clearing away malaria.

The atmosphere, considered as a transparent medium, has also great effects on light by its refractive power, and the reflection of the aqueous masses it contains. Hence arises twilight, which mitigates the transition of day to night. Again, by the refractive power of the atmosphere distant terrestrial objects are elevated to the view when the spherical curvature of the earth would otherwise have caused their concealment; various op-

tical illusions, as the mirage, fata morgana, &c., are all easily explained from the same refractive power under peculiar circumstances of temperature. By this medium sound is conveyed and odours are disseminated; the clouds which float in it soften the direct glare of the solar beams, and its aqueous particles, fluid or frozen, produce the beautiful phenomena of halos, rainbows, false suns, &c. Its greater specific gravity elevates the balloon, by means of which the nature of the upper strata of the air may be ascertained, and the barometric elevation and temperature observed, which furnish data for calculating the physical limits of the atmosphere.

Any particle of the revolving atmosphere is acted on by two forces, namely, gravity, which is directed nearly to the centre of the earth, and the centrifugal force produced by rotation, which tends directly from the earth's axis. Beyond a certain point the centrifugal force predominates, and no particle there situated could remain attached to our atmosphere.

That point therefore defines the extreme limit to which it is *possible* for our atmosphere to extend, and which is at a distance of about 25,000 miles from the centre, though it by no means follows that it must extend so far; and physical causes may be made to show that the height is really less than 100 or 200 miles.

It has been stated that the unequal distribution of heat in the atmosphere is a main source of the velocities and directions of winds, and consequently of the distribution of climate; but, on the other hand, the earth itself, having its own distribution of heat, reacts on the atmosphere, and produces dew, hoar-frost, &c. In like manner the sea and the Polar fields of ice materially affect the general distribution of heat.

The general causes of the temperature of the globe are the proper heat of the earth and the radiation of the sun; their effects however are greatly modified by various local circumstances, such as the vicinity of seas or mountains, and the radiating power of the soil, together with the conducting powers of the strata subjacent to the particular places, with other causes less permanent.

With respect to the proper heat of the earth, we observe in any latitude that at a depth which is small compared with the radius of the globe, the temperature is permanent throughout the year, the effects of solar radiation being confined to a superficial stratum of inconsiderable thickness. This fact has been fully established by long-continued observations in the cellars of the Observatory at Paris, and by observations in the mines of Cornwall, in Scotland, and other countries. If this stratum be supposed to be stripped off, the internal nucleus may be considered as nearly a spherical mass, arrived at a permanent state of temperature in each part, and subject at its external surface to a given distribution of heat, or to a given power of exterior conductibility. The depth at which this permanence of temperature occurs is different in different latitudes, inasmuch as the solar action on the superior stratum is also different on account of the greater or less obliquity of its rays, and likewise on account of the earth's elliptic annual motion. Thus we have the following observed relations between the permanent temperatures and the corresponding latitudes:—

	Lat.	Permanent Temperatures.
Equator	0°	78°
Cairo	30°.2	72°.50
Paris	48°.50	53°.60
Berlin	52°.40	49°.28
Vadso	70°	36°.

With respect to the heat of the external stratum, it is principally dependent on the radiation of the sun, the effect of which depends on the duration and the obliquity of the solar rays, both of which are dependent on the declination of the sun and the latitude of the place. The integral taken throughout the year depends therefore solely on the latitude: from this integral the calculated mean temperature is derived, but differs in most cases from the observed, inasmuch as the propagation of heat in the sea and in the air affects unequally those places in the same parallel which are near to or distant from the coasts, and the unequal quantity of continent in the northern and southern hemispheres produces a similar result with respect to them.

The direct heat of the sun being unequally distributed over different parts of the globe is the primary cause of the variation of climate; the effect of its rays is felt to a considerable depth in the sea, but its diurnal action on land is sensible only for a few inches in depth; the annual action however extends throughout the superior stratum of variable temperature above mentioned. The mean temperature of a place is generally estimated by taking the average of the diurnal temperatures during the four seasons of the year, and again taking the average of these four averages.

Dr. (Sir David) Brewster gives the formula $t = 81.5° \cos. L$, t being the mean temperature at any place, in degrees of Fahrenheit's thermometer, and L being the latitude of the place; and Mr Atkinson proposes the formula

$$T = t - \frac{h}{251 + \frac{h}{200}},$$

in which T is the mean temperature at any altitude h in feet, in a given place where t is the temperature of the surface.

The names of Isotheral, Isocheimal, and Isothermal Lines have been given to lines passing through places which have equal mean summer, winter, or annual temperatures, the two former having contrary courses, and the third intermediate. The difference of latitude between places in the New and Old Worlds, on the same isothermal line, is considerable, as, for instance, in Belgium, at 51° N. lat. 2° E. long., and at Boston 42½° N. lat. 71° W. long., the isothermal line of temperature is 50° Fahr.

The sea varies in temperature much less than the air; the region of warmest water extends about 5½° on each side of the equator, but rather farther to the south than to the north. There appear to be two points of greatest cold near the North Pole, attributable to the different propag-

tion of heat in the New and Old Worlds above remarked. Dr. Brewster supposes them to be about 80° of lat., and situated in 95° E. and 100° W. long.; the temperature at these points appears to be decidedly below zero of Fahrenheit.

METHODISM designates the great English schism of the 18th century. The instruments of the propagation of Methodism were, with few exceptions, persons from the lower classes of society. The Huntingdon family, in the female portions of it, took it under their patronage, and there were two or three other ladies of rank who attached themselves to the Countess of Huntingdon, and encouraged the labours of the Methodist preachers. The advancement of methodism in this country is chiefly to be attributed to the late Mr. Wilberforce and the late Mrs. Hannah More, who were Methodists in one sense of the term only; that is, they continued in the Church, but pleaded for greater strictness of life and greater zeal in the ministry. There are now many different classes of persons who collectively are called Methodists;—1, the Wesleyan Methodists; 2, the Methodists of Lady Huntingdon's Connexion; 3, the Methodists of the New Connexion; 4, the Primitive Methodists; 5, the Bible Christians; 6, Protestant Methodists; 7, Association Methodists; 8, the Inghamites. There is also a large body of persons, chiefly in Wales, calling themselves Calvinistic Methodists, who are not included in what is called Lady Huntingdon's Connexion.

The year 1729 is considered as the time at which Methodism began. John Wesley, who is universally considered as its founder, was residing at Merton College, Oxford, when, with a brother and a few other young men who, like them, were intended for the ministry in the Church, he formed a little association for their common spiritual and religious improvement. It is said that these persons got the name of Methodists, arising out of a casual observation of a member of Merton College, who said, 'Here's a new sect of Methodists sprung up.' The Wesleys were sons of a country clergyman of Epworth, in Lincolnshire. [WESLEY.] Under WHITEFIELD will also be found a notice of George Whitefield, another student at Oxford, who joined the Wesleys in 1732.

In the year 1740 the first Methodist society was formed. It met at a chapel in Moorfields, and it was in 1743 that the rules, which still continue in force, were drawn up for this and other societies, especially those of Bristol and Kingswood, the part of the kingdom in which, at the beginning of his ministry, Wesley had chiefly laboured. These rules set forth, that the Methodists are a people who, in addition to the form of Christianity, seek the power of godliness, and manifest it by good works: the societies are united, that, by counsel, exhortation, and prayer, they may assist each other in the great work of religion. These societies, in the most important or Wesleyan Connexion, are divided into classes of ten, twenty, or more persons, and he that is supposed the best qualified by mental and religious excellency, is appointed the leader.

A number of united societies lying around some central town or large chapel is known as a circuit. The villages or chapels in the vicinity of the centre are regularly visited by the ministers at stated times for the purpose of conducting worship, and the discharge of other pastoral duties. A number of circuits are united and known as a district.

In the month of May, the district is assembled; the ministers alone the first day, to examine the moral character, Methodistical orthodoxy, and obedience of every minister therein; afterwards, in the presence of the circuit-stewards, they wind up the financial affairs of the circuit for the Methodistic year, which in May has nearly expired.

At the May district-meeting, when the circuit-stewards have taken their departure, one of its ministers is chosen by ballot, as its general representative at the coming Conference. Then the meeting determines how many additional ministers belonging to the district shall be allowed to proceed to the Conference. The Conference, strictly and truly, consists only of one hundred preachers, whose names are in the deed that gives it a legal existence, but all the preachers allowed to go from the respective districts are suffered to sit therein, and vote as integral parts thereof. The doctrinal test of the Methodists is found in Mr. Wesley's Sermons, and his notes on the New Testament. The disciplinary test is found in the minutes of Conferences, the statute-books of the Wesleyans.

Dissensions at various times caused members to secede, and constitute themselves as independent bodies. Among these are—the New Connexion, the Bible Christian Methodists, the Primitive Methodists, the Protestant Methodists, and the Association Methodists.

The reader who wishes to see how Methodism appears to a person of an acute and discerning mind, who is not of the body, may consult the 'Life of Wesley,' by Robert Southey, a work in which there is much profound reflection. Other Lives of Wesley there are by Hampson, by Dr. Coke, Dr. Whitehead, Henry Moore, and Mr. Watson. We may mention also a little volume entitled 'A Miniature of Methodism, or a Brief Account of the History, Doctrines, Discipline, and Character of the Methodists,' by Valentine Ward. There is also 'The Portraiture of Methodism,' by Joseph Nightingale. Those who wish thoroughly to understand Methodism would do well to read the 'Journal of John Wesley.'

METHO'DIUS and CYRILLUS, two brothers, the apostles of Christianity among the Slavonians in the eighth century, and the inventors of the Slavonian alphabet, were natives of Salonica, or Thessalonica, in Greece. Methodius held a high command in the Greek army, under the Emperor Michael III. Cyrillus was in holy orders, and keeper of the library of Santa Sophia. He was first sent as a missionary to convert the Saracens inhabiting the banks of the Euphrates; and about the year 863 he and his brother Methodius proceeded on a religious mission to the Slavonians. They translated the Psalter, the Gospels, and many other parts of the Scriptures into

Slavonic. Cyrillus returned to Rome, where he died about 871. Methodius remained and continued his labours for about 30 years, in the course of which time he is said to have translated all the Scriptures. None of the original manuscripts are extant.

METIUS, ADRIAN, was born at Alkmaar, a town of North Holland, 9th of December, 1571, died at Franeker, where he was professor of mathematics, September 26, 1635. His father, whose name, according to Lalande, was likewise Adrian, although Montucla calls him Peter, was a military engineer of considerable reputation. His skill contributed greatly to the successful defence of Alkmaar, when besieged by the Spaniards in 1573. It was he also, and not his son, who first gave 335:113 as the ratio of the circumference of the circle to its diameter.

From his father young Adrian soon acquired a practical knowledge of the mathematics, in which he published several works.

METIUS, JAMES, was a younger brother of the preceding, and one reputed inventor of the refracting telescope. On this point Montucla quotes the following passage from the 'Dioptrics' of Descartes, wherein the latter says, 'It is now about thirty years since this admirable invention was first ascribed to James Metius, a man who never studied the mathematics, notwithstanding that both his father and brother had made them their profession. This individual, while one day amusing himself with a few burning-glasses, after looking through them singly, began to look through them by pairs, placing one at each extremity of a short tube. In this way a convex and concave lens happening to be employed together, the first refracting telescope is said to have been constructed.' (Montucla, tom. ii., p. 230.) The reputed date of this discovery is the beginning of the 17th century.

METON. The astronomer Meton was living at Athens at the beginning of the 87th Olympiad, B.C. 432. All we know which is worth recording here is, that the solstices which he observed with Euctémon are preserved by Ptolemæus, and that he was the founder of the celebrated lunar cycle (called Metonic) which is still preserved by the Western churches in their computation of Easter.

METOPE. [Basso Rilievo.]

METRE (from the Greek *μέτρον, metron*) is that quality of verse by which it is to the ear distinguishable from prose. A distinction has been drawn between ancient and modern metres, one being said to depend on quantity, the other on accent; quantity and accent being further supposed to differ in kind. A little reflection however will tend to convince us that delicacy of ear has as much to do with the difference between ancient and modern metres as any fancied change from quantity into accent. The Greek and Roman metres differ from our own in being more numerous, and in allowing collocations of syllables (called feet) such as we could scarcely feel to be consonant with rhythm. The cause of this difference seems to lie in the form of each language.

Another grand distinction between ancient and modern metres is that of rhyme, which hardly ever occurs in ancient poetry.

METRONOME (from *μέτρον, measure*, and *νόμος, a division*) a very ingenious instrument, a pendulum, the point of suspension of which is between the extremities, invented and introduced about the year 1814, by John Maelzel (civil engineer and mechanician to the Emperor of Austria), for the purpose of determining the movement, *i.e.* the quickness or slowness, of musical compositions. Of Maelzel's Metronome there are two kinds. The one is a pendulum kept in motion by a spring and wheelwork, and which ticks the vibrations:—the other is also a pendulum, but without any machinery, and acting only so long as the force of the impulse given shall last. The former, therefore, it will be obvious, is complicated and expensive; the latter is simple and cheap.

Much opposition was made to the use of this excellent instrument, when first introduced; but no sensible composer or performer now entertains a doubt of the usefulness of the Metronome or of some kind of pendulum answering the same purpose.

METROPOLIS. [Colony.]

METROPOLITAN STAGE CARRIAGE [Hackney Coach.]

METROSIDE'ROS (from *μήτρα*, heart-wood and *σίδηρος*, iron), a genus of plants belonging to the natural order *Myrtaceæ*. The species are trees or shrubs. *M. vera*, true Iron-Wood, is a native of Java and Amboyna, among rocks. The Chinese and Japanese value the wood of this tree, which they apply to many purposes, as the making of rudders, anchors, &c., for their ships and boats. *M. polymorpha* is a tree, and grows in the Sandwich Islands, and is said to be the plant from which are made the clubs and other weapons employed in warfare by the South Sea Islanders.

METZ, the ancient *Divodurum Mediomatricorum* and the *Mettis* of the fifth century, now capital of the French department of Moselle, is built on the Moselle at the point where that river is joined by the Seille, in 49° 7′ 14″ N. lat., 6° 9′ 53″ E. long., 170 miles E. by N. from Paris, and has 52,763 inhabitants, besides the garrison which numbers 10,000 men. The town is washed on the west by the Moselle, which makes a bend and traverses the town; the Seille enters the city in the south, dividing into two branches, one of which flows between the ramparts, the other runs through the town and drives several mills: these two rivers are crossed by seventeen bridges. Metz is, after Strasbourg, the strongest fortress in France. It is girt by a regular system of fortifications, and entered by nine gates furnished with drawbridges. The defences were constructed by Marshals Vauban and Belle-Isle; amongst the most important of the works erected by them are—the fort of Bellecroix, which is built on a hill, and commands all the east of the town from the gate Des-Allemands to the Moselle; and the fort of La-Double-Couronne, which defends the southern part of the city.

Metz is in general a well-built town; the

houses are mostly of cut stone; the quarter that lies on the right bank of the Moselle stands high, and contains many steep streets; on the left bank the site is level. The streets however are in most instances narrow, crooked, and ill laid out; many of the houses are adorned with bas-reliefs. In the centre of the town is the esplanade, which stands on high ground, and is one of the finest promenades in Europe, formed by numerous avenues of trees, and commanding a fine view over the rich valley of the Moselle; near it is a vast space on which the troops in garrison are exercised. Among the many remarkable structures of Metz must be mentioned—the Arsenal, which is of vast extent, and amongst other stores contains 80,000 muskets: the cathedral, founded in 1014 but not finished till 1546; the elegance, delicacy, and boldness of this structure have been always much admired; of its lightness some idea may be formed from the circumstance that the total area of its windows (many of them of the best age of glass-painting) amounts to no less than 4869 square yards: the church of Notre-Dame-de-la-Ronde and that of the abbey of St.-Vincent, both of which are ancient and remarkable structures: the college buildings, formerly the abbey of St.-Vincent: the military hospital, a vast building contiguous to the barracks and close to the Moselle: and the palais-de-justice, in which the courts are held and the public library of 30,000 volumes is kept. Next to these, the prefect's residence, the town-house, the mint, the churches of St.-Martin, St.-Nicolas, and Sainte-Segolène, and another library of 10,000 volumes of select works, and rich in manuscripts by Vauban, Monge, and other writers on fortification and the art of war, are the most notable objects in the town.

Metz gives title to a bishop, whose see is the department of Moselle; it is the seat of a High Court and University Academy for the departments of Ardennes and Moselle. Besides a tribunal of first instance, a tribunal and chamber of commerce, the city possesses an exchange, an artillery and engineering school, a royal college, several literary and scientific societies, a diocesan school, an ecclesiastical college, and several other schools, in which lectures are delivered gratuitously on midwifery, botany, drawing, painting, and music.

Among the industrial products of the town are broadcloth, flannel, and other woollen stuffs, hosiery, plush, small wares, muslin embroidery, room-paper, glue, chicory-coffee, cotton-twist, excellent beer, nails, tiles, and leather. The commerce is composed of these articles, and of wine, brandy, confectionary, groceries, furniture, hides, iron, &c. A branch railroad, now in course of construction, will join Metz to Nancy on the Paris-Strasbourg line.

(*Dictionnaire de la France.*)

METZ, CONRAD MARTIN, was born at Bonn in 1755. He studied under Bartolozzi in London. He published in 1790 a set of 33 engravings after George the Third's collection of drawings by Parmegiano, and in 1791 a set of 63 plates after the designs by Polidoro da Caravaggio, in the possession of Sir A. Hume, Bart. In 1801 Metz went to Rome, and commenced a series of engravings after the Last Judgment in the Sistine Chapel, by Michael Angelo. Metz died at Rome in 1827.

METZU, GABRIEL, was born at Leyden in 1615. He obtained a great reputation at Amsterdam while still young. Metzu belongs to the higher class of painters of domestic subjects. He painted also a few portraits, of which there is one of Admiral Van Tromp in the Louvre. Many of his works have been engraved. Metzu died, according to D'Argenville, in 1658; there is however a picture of a poulterer in the Gallery of Dresden, by him, dated 1662; the date therefore of his death is uncertain.

MEUDON. [SEINE-ET-OISE.]

MEULAN. [SEINE-ET-OISE.]

MEULEN, ANTHONY FRANCIS VAN DER, born at Brussels in 1634, was a disciple of Peter Snayers. From Brussels he went to Paris, on the invitation of Colbert. His talents as a battle-painter recommended him to Louis XIV., whom he always accompanied in his campaigns. He designed on the spot the most remarkable events. Le Brun gave him the execution of the horses in his celebrated paintings of the battles of Alexander the Great. Van der Meulen painted also landscapes, and other subjects, with equal excellence. His principal works are at Paris. In the 16th and 18th vols. of the 'Cabinet du Roi,' there are 152 engravings after his works. He was chosen member of the French Academy of Painting in 1673. He died in 1690.

MEUM, a genus of plants belonging to the natural order *Umbelliferæ* and to the tribe *Seselineæ*. There are two species of this genus. *M. Athamanticum*, Common Bald-Money, is a highly aromatic plant, with numerous white and yellow flowers. It is a native of Europe, in dry mountain pastures, and is found in England and the mountains of Scotland. The roots, seeds, and every part of the plant are aromatic, and are used in the countries where it grows as stomachics and carminatives.

MEUNG. [LOIRET, misprinted *Meuny.*]

MEURSIUS, JOHN (the Latinised form of his real name, which was De Meurs), was born near the Hague, in 1579. He was brought up at the University of Leyden, and had the care of the education of the children of Barneveldt. In 1610, Meursius was appointed professor of history at Leyden, and in the year following professor of Greek. After the execution of Barneveldt, on the 14th of May, 1619, Meursius was exposed to great annoyance; and he accepted an invitation from the King of Denmark, in 1625, to settle in his dominions. He died in September, 1639.

Meursius was a diligent and laborious scholar. He edited several Latin and Greek writers, and wrote many works on historical and archæological subjects, which were collected and published by Lami, Florence, 1741–63, 12 vols. fol.

MEURTHE, a department in France, consisting of portions of the former duchies of Lorraine and Bar, and of the southern part of the district of Trois-Evêchés [LORRAINE], is bounded N. by the

department of Moselle, E. by that of Bas-Rhin, S. by that of Vosges, and W. by that of Meuse. It lies between 48° 22′ and 49° 2′ N. lat., 5° 42′ and 7° 16′ E. long. It measures 70 miles from E. to W., with an average width of 35 miles. The area is 2351 square miles, and the population is 445,991, which gives 189.7 to the square mile, being 15.95 above the average per square mile for the whole of France.

The department is remarkable for the beauty of its scenery, the fertility of its soil, and the variety of its productions. The principal chain of the Vosges mountains runs along the eastern boundary, reaching in one of its summits to the height of 1148 feet above the plain. The rest of the department presents a pleasing variety of hills, dales, and well watered valleys—the hills, which branch off from the Vosges, nowhere exceeding 650 feet in height, and nearly all running in a north-western direction. The hill slopes, and a considerable portion of the plains, are covered with dense forests.

The department takes its name from the river *Meurthe*, which rises in the east of the department of Vosges, and running first N. and then N.W., past St.-Dié and Raon-l'Étape, enters the department of Meurthe, below this last town: here it flows through a fine valley, fertilized by the deposits of its frequent inundations, in a general north-west direction past Lunéville, Rosières, and Nancy, a little below which it falls into the Moselle, on the right bank, after a course of 100 miles. Great quantities of fir planks for Holland, rough timber, and fire-wood, are floated down this river, which is navigable for only 6 miles above its junction with the Moselle. Its principal feeders on the right bank are—the *Plaine*, which forms part of the southern boundary of the department; the *Vézouze*, which joins the Meurthe at Lunéville; and the *Sanon*, which flows westwards from one of the numerous lakes on the western side of the Vosges mountains, and enters the Meurthe a few miles E.S.E. of Nancy. On the left bank, the Meurthe receives the *Mortagne* a few miles S. of Lunéville. The west of the department is drained by the Moselle, which here receives the Madon on its left bank. The *Seille*, which springs from one of the lakes in the east of the department, flows through a very fertile valley, first W. and then N., falling into the Moselle at Metz, in the department of Moselle. The *Sarre* rises on the western side of the main chain of the Vosges mountains, in the south-east of the department, and flows generally N. as far as Sarreguemines, in the department of Moselle. Below this town it enters the Prussian Rhein-Provinz, through which it runs N.W. to its junction with the Moselle a few miles above Trèves. The department is traversed by 8 royal, 15 departmental, and a great number of parish roads. The Paris-Strasbourg railway, now open from Strasbourg to Phalsbourg, crosses the department, passing through Nancy, whence a branch runs N. to Metz. The canal Des-Salines, which runs from Deuze to Sarrealbe in Moselle, unites the Seille with the Sarre.

The plains and valleys of the department are very fertile in wheat, barley, and oats. About 400,000 quarters of wheat are grown annually, of which a large portion is sold in the markets of the department of Vosges for the supply of some of the more southern departments. From the time that the old ordonnance of the Dukes of Lorraine against planting the vine in soils fit to yield wheat fell into disregard, a large breadth of the best lands was laid out in vineyards; and in favourable years, which however are few, owing to the frequency of late frosts in the spring, a very large quantity of wine is made; in ordinary years the produce is 20,064,000 gallons. The surplus over the home consumption is sold into Alsace and the department of Vosges. In the arrondissement of Sarrebourg, where the climate, owing to the proximity of the Vosges mountains, is colder than in the rest of the department, the vine is not cultivated at all. Rape is extensively grown, both for green food and for making oil. Hay is abundantly produced along all the river bottoms. Potatoes, potherbs of all kinds, and fruits are largely cultivated. Horses, which are small, are used for draught and in the plough, except on the slopes of Vosges, where the ox is more frequently seen at farm labour. Cows also are small; they are however of a tolerable breed and good milkers. Hogs are numerous; pork is a staple article of the food and consequently of the commerce of the people. The forests still contain the deer, the roebuck, and the wild boar; wolves, foxes, and weasels are common enough.

Iron ore is found, but too poor to be worth digging for. Building stone, marble, and limestone are quarried; lithographic stone, red and gray granite, grindstone grit, glass sand, potters' clay, &c., are found. A mine of salt-rock at Vic, and several salt-springs, are the most valuable mineral treasures of the department.

The industrial activity of the department has been greatly developed within the last few years, and is exerted on a great variety of products, among which are—woollen cloth, calico, canvas, embroidered muslins and cambrics, playing cards, room-paper, cut and plate glass, tobacco-pipes, oil, mineral acids, cotton-twist, gloves, beet-root sugar, candles, basket and wood work, &c. There are also some iron and bell foundries, numerous glass works, tan-yards, paper-mills, dye-houses, and potteries. Of the articles just enumerated or indicated and of its agricultural produce the commerce of the department is composed. About 100 fairs are held in the course of the year.

The inhabitants are a mingled German and French race; the German language is still spoken in the east of the department. They are in general a grave people—deficient in the usual vivacity of Frenchmen; but they are among the most industrious and orderly of the inhabitants of France. The department is distinguished for the number of successful candidates it sends every year to the entrance examinations of the École Polytechnique in Paris.

The department contains 1,504,733 acres, distributed among 165,382 proprietors, and in 1,185,423 parcels. Of this area, 750,328 acres are under tillage; 452,862 acres are forest and

wood land; 177,554 acres are grass land; 40,455 acres are under vine culture; 15,736 acres are laid out in gardens, orchards, and nurseries; 15,250 acres are covered with heaths and moors; and 21,685 acres are occupied by rivers, lakes, and canals.

The department is divided into 5 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Nancy . . .	8	121	144,526
Château-Salins	5	150	70,326
Lunéville . .	6	201	88,197
Sarrebourg .	5	118	77,449
Toul . . .	5	127	65,493
Total . .	29	717	445,991

Of the arrondissement of Nancy and of the whole department the chief town is NANCY. *St.-Nicolas-du-Port*, 5 miles E. by S. from Nancy, has a handsome gothic church, and 3178 inhabitants, who manufacture linen, brandy, cotton and woollen yarn, leather, and beer. *Pont-à-Mousson*, 16 miles N. from Nancy, takes its name from the bridge here thrown across the Moselle, and from the old fortress of Mousson, which is built on a hill E. of the town. It is surrounded by ramparts. The most remarkable objects in the town are—a gothic church built about the end of the 13th century; the town-hall; the large cavalry barracks; the hospital; and a square, surrounded by arcades. Pont-à-Mousson has ecclesiastical and communal colleges and 8,010 inhabitants. The manufactures consist of coarse woollens, pottery, tobacco-pipes, beet-root sugar, beer, leather, and tiles.

In the arrondissement of Château-Salins, the chief town, *Château-Salins*, stands 17 miles N.E. from Nancy, in a pretty valley watered by a feeder of the Seille, and has a tribunal of first instance, glass-works, tan-yards, and a population of 2468. *Dieuze*, or *Duze*, famous for its salt-springs, stands on the right bank of the Seille, 10 miles E. of Château-Salins, and has a college and 3964 inhabitants. In Roman times the town bore the name *Decem Pagi*, and was considered an important post on the military road from Metz to Strasbourg. *Vic*, S. of Château-Salins, is a narrow valley drained by the Seille, has salt-springs, a tribunal of first instance, and 3277 inhabitants.

In the arrondissement of Lunéville the chief town is LUNÉVILLE. *Baccarat*,, situated on the Meurthe, which is here crossed by a bridge of 9 arches, is famous for its manufacture of cut glass, and has 3216 inhabitants, who manufacture also common glass, calico, ironmongery, chemical products, leather, &c. *Blamont*, a well-built town, situated in a fine corn and grass country E. of Lunéville on the Vézouze, has a population of 2577. *Gerbeviller*, formerly a fortified town, stands in a plain on the left bank of the Mortagne, and has 2208 inhabitants.

Of the arrondissement of Sarrebourg the chief town, *Sarrebourg*, is situated in a fertile country on the right bank of the Sarre, 42 miles E. from Nancy, and has a tribunal of first instance and 2499 inhabitants, who manufacture cotton-cloth, files, scythes, saws, tin-ware, and chemical products. The position of the town at the opening of an important pass in the Vosges mountains, makes it a place of importance in a military point of view. *Phalsbourg*, 9 miles N.E. of Sarrebourg, at the entrance of the defiles of the Vosges, and on the Paris-Strasbourg railroad, is a well-built and strongly fortified town, with a population of 4947. The most remarkable structures are—a large church, built in the reign of Louis XIV.; the college buildings; the barracks; the arsenal; the town-hall; and the market-house.

The arrondissement of Toul is named from its chief town, *Toul*, which stands at the foot of vine-clad hills, in a fertile plain on the Moselle, here crossed by a stone bridge of 7 arches, at a distance of 13 miles W. from Nancy, and has a tribunal of first instance, a college, and 8937 inhabitants. The town is irregularly built, but contains some good structures. Among the objects deserving of notice are—the cathedral, which contains some fine sculptures; the church of St.-Gengoult; the town-hall; the two hospitals; the barracks; the corn-market; and the ramparts, which are flanked with 9 bastions. This town is noted for its embroidery; pottery, beer, and leather are made.

The department forms the see of the Bishop of Nancy, is included in the jurisdiction of the High Court (Cour Royale) and University Academy of Nancy, and belongs to the 2nd Military Division, of which Metz is head quarters. Under the late monarchy it returned 6 members to the Chamber of Deputies; it now has 9 representatives in the Legislative Assembly of the Republic. (*Dictionnaire de la France; Annuaire pour l'An* 1849.)

MEUSE, the ancient *Mosa*, and the Dutch *Maas*, a river which rises in the plateau of Langres, in the department of Haute-Marne, and flows first in a general northern direction, and then west into the German Ocean, having drained portions of France, Belgium, and Holland. Its upper current is formed by two small streams that unite at Fort-Fillières; but it is only after passing the village and the ruined castle of Meuse that the name of Meuse is applied to the river. Having traversed in a direction of N. by E. the eastern part of Haute-Marne, the Meuse enters the department of Vosges, where, flowing under ground for 4 miles, it reappears a little S.W. of Neufchâteau, not far N. of which it crosses the boundary of the department of Meuse. Through the whole length of this department it flows N. by W. in a narrow valley past Commercy, Verdun, (where it becomes navigable,) and Stenay. On entering the department of Ardennes it has a very winding course, first N.W. past Sedan, Mezières, Charleville, and then N. by E. past Fumay and the fortress of Givet, just below which it enters the kingdom of Belgium. Here it traverses the province of Namur, in the direction of N. by W. as far as the town of Namur, whence

it flows N.E. to Liège, and again turning N. by E. it enters the Dutch province of Limburg, which it traverses in the same direction to a few miles below Venloo, where it turns nearly N.W. as far as Grave. From the neighbourhood of Grave it flows W., and separates North Brabant from Guelderland and Holland. Below Gorcum it divides into two arms. Of these the northern one, flowing through the province of Holland, takes the name of Merwe, as far as Dort, where it subdivides into two branches, the northern one called the Maas, the southern one the Oude Maas, which inclose between them the island of Ysselmonde; these branches, uniting on the eastern side of the isle of Rosenburg, form a wide current, which enters the North Sea to the N.W. of the island of Voorne. The southern arm, having passed through the Biesbosch, takes the name of Hollands-diep as far as Willemstad, below which it also subdivides into two branches; one of these, first called Haring-vliet, and more to westward Flakkee, enters the North Sea by a wide æstuary between the islands of Voorn and Over-Flakkee; the other flows into the North Sea between the islands of Over-Flakkee and Schouwen, having first sent part of its waters to the eastward of Schouwen island into the Ooster Schelde. The whole course of this river is 552 miles in length, 256 of which are in France; it is navigable from Verdun to its mouth, a distance of 430 miles; 133 of these are in France. The principal feeders of the Meuse in France are—the Mouzon, the Vair, the Chiers, the Semoy, on the right bank, and the Bar on the left; in Belgium, the Lesse, the Ourthe, on the right, and the Sambre on the left bank; in Holland, the Roer, the Niers, the Linge, the three branches of the Rhine known as the Waal, the Leck, and the Yssel, on the right bank, the Dommel and the Merk on the left. Many of these rivers are navigable; those that are not so are available for floating timber. Down the Meuse itself the chief articles of transport are marble, slates, iron, timber, and corn.

The basin of the Meuse is for the most part very narrow, such of it as lies in France, being a mere strip of a few miles in width, hemmed in between high hills; lower down, where it includes the valleys of the Sambre and the Ourthe, it attains its greatest width, which is about 90 miles. North of Liège the basin again becomes narrow, and so continues to the final bend of the river westward, where in some places the width of the basin is between 30 and 40 miles. The lower part of the basin of the Meuse includes a good deal of fertile flat land, with not a few marshes and peat bogs; the upper part of it is in general fertile, and presents some pretty and some bold scenery. The basin of the Meuse communicates with those of the Rhine, the Seine, and the Schelde, by means of canals.

MEUSE, a department in France, formed out of portions of the duchies of Lorraine and Bar, and a part of Trois-Evêchés [LORRAINE], is bounded N.W. and N. by the department of Ardennes and the duchy of Luxembourg, E. by the departments of Moselle and Meurthe, S. by those of Vosges and Haute-Marne, and W. by those of Marne and Ardennes. Its greatest length from N. to S. is 80 miles, and its average width is 33 miles. The area is 2396 square miles, and the population is 325,710, which gives 135.93 to the square mile, being 37.82 below the average per square mile for all France. There is a considerable number of gipsies in this department.

The Faucilles mountains, which, running through the departments of Haute-Marne and Vosges, connect the plateau of Langres with the principal chain of the Vosges mountains, send out two ranges of hills that inclose the narrow valley of the Meuse, and traverse the department of Meuse from S.S.E. to N.N.W., terminating northwards in the wooded heights of the Ardennes. From these two ranges, which nowhere exceed the height of 1600 feet, numerous lateral offshoots spring, so that the surface presents a great variety of hill and dale, and plain and valley. The more western of the two ranges is often designated by the name of the *Argonne* hills; it forms the watershed between the Meuse and the Seine: the eastern range, which in general is more properly described as a high table land, divides the feeders of the Meuse from those of the Moselle. These heights, which consist of fossiliferous rocks, are in many places covered with extensive forests, in others with pastures, whereon great numbers of cattle are fed. The lower slopes are laid out in vineyards, which yield ordinary white and red wines of the first class. The soil of the plains is in general shallow and unproductive; but the river valleys, especially those of the Meuse and the Ornain, are of the greatest fertility, and cultivated with the utmost care.

The chief river is the MEUSE, which gives name to the department, and is navigable from Verdun to its mouth. The west and south-west of the department are drained by the AISNE and its feeder, the Aire; and by the Ornain and the Saulx, which unite their waters, and, swelled by the Chee, flow into the Marne a little below Vitry-sur-Marne, in the department of Marne. The Madine and the Ornes flow N.E. into the Moselle. The Oison and the Othain drain the northern district, and flow N.W. into the Chiers, a feeder of the Meuse. The department is crossed by 9 royal, 12 departmental, and a great number of cross roads. The Paris-Strasbourg railroad, now in course of construction, traverses the department, passing through Bar-le-Duc. The climate is mild in the valleys, but harsh and cold on the mountains and on the high table-land east of the Meuse.

Of the usual bread-stuffs, more than is enough for the consumption is raised. Hemp, flax, and oleaginous seeds are cultivated. Cattle, swine, and goats are numerous; horses are small. Gooseberries and strawberries are grown in very large quantities in the neighbourhood of Bar-le-Duc and Ligny, whence they are largely exported in the preserved state. Gruyère and cream cheese are made in the arrondissement of Commercy. About 22,000,000 gallons of wine are made annually, two-thirds of which are consumed on the spot, and the remainder is exported to Belgium.

Several iron mines are worked; good building-

stone, marl, potters' clay, and slates are found. Fossils of great variety, and some of large dimensions, are met with.

The chief manufactures are—iron, made in 40 forges and furnaces, cotton cloth and twist, hosiery, oil, glass, paper, pottery, beer, leather, inferior brandy, &c. The commerce of the department is fed by the articles already enumerated, and by timber, oak staves, clover seed, butter, fat pork, hides, wool, confectionary, &c. Above 100 fairs are held in the course of the year.

The department of Meuse contains 1,533,480 acres, distributed among 158,965 proprietors, and into 2,616,442 parcels. Of the whole area 828,302 acres are under cultivation; 442,920 are covered with woods and forests; 34,349 are under vine culture; 122,252 are meadow and grass land; 18,254 acres are laid out in gardens, orchards, and plantations of various kinds; 29,634 acres consist of barren moor land; 15,294 acres are covered with rivers, ponds, marshes, or canals; and 35,649 acres are occupied as roads, streets, and squares.

The department is divided into 4 arrondissements, which, with their subdivisions and population are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Bar-le-Duc .	8	128	83,756
Commercy . .	7	181	87,485
Montmédy .	6	132	68,956
Verdun . . .	7	150	85,513
Total . .	28	591	325,710

Of the arrondissement of Bar-le-Duc, the chief town is BAR-LE-DUC, which is also the capital of the department. *Ancerville*, a small place S. of Bar-le-Duc, has 2181 inhabitants. *Ligny*, a well-built town, prettily situated on the left bank of the Ornain, has several iron forges and smelting furnaces, a cotton-spinning factory, tanyards, and a population of 3147. The town is noted for its manufacture of anvils.

In the arrondissement of Commercy, the chief town, *Commercy*, stands on the left bank of the Meuse, 20 miles E. from Bar-le-Duc, and has a tribunal of first instance, a college, and 4761 inhabitants. The town is well built, and has several pretty promenades. The barracks, riding-school, town-hall, and corn-market are the most remarkable buildings. In the environs, which are very beautiful, there are several iron forges and smelting furnaces. The manufactures of Commercy are calico, cutlery, beer, and leather. *St.-Mihiel*, a pretty well-built town, with a college and 6462 inhabitants, is situated on the right bank of the Meuse, which here flows through a narrow valley, shut in by high hills. The church of St.-Étienne is remarkable for its sculptured representation of the entombment of Christ. Cotton cloth and yarn, iron, carpenters' tools, and leather, are the chief industrial products. *Vaucouleurs*, a town of 2500 inhabitants, stands on the slopes of a hill above the left bank of the Meuse, 12 miles S. from Commercy, and has manufactures of cotton cloth, cotton hosiery, and leather.

In the arrondissement of Montmédy, the chief town, *Montmédy*, is situated at the foot and on the slope of a hill above the Chiers, a feeder of the Meuse, and has a college, a tribunal of first instance, and 3169 inhabitants. It is an ill-built place, with narrow crooked streets and badly constructed houses. This town, being situated on the frontier of France, is regularly fortified: its defences have been repaired and strengthened within a few years. It has hydraulic saw-mills, tanyards, oil-mills, and some hosiery manufactures. *Stenay*, a well-built town, 8 miles W. from Montmédy, is situated in a fertile spot on the right bank of the Meuse, which forms several islands, and drives the machinery of several iron forges below the town. The inhabitants, who number 3775, manufacture beet-root sugar, wine-casks, beer, leather, iron, and bricks.

In the arrondissement of Verdun, the chief town, *Verdun*, stands on the Meuse, which here begins to be navigable in 49° 9′ N. lat., 5° 19′ 20″ E. long., at a distance of 145 miles E. from Paris, and has tribunals of first instance and of commerce, a diocesan school, communal and ecclesiastical colleges, and 15,553 inhabitants. The town is defended by a citadel constructed by Vauban, and by ten detached redoubts. The Meuse flows through the town in five branches, which unite outside the fortifications. Verdun is in general well built; but the streets, some of which are steep, are badly paved. An esplanade, planted with trees, divides the citadel from the town. The residence of the bishop of Verdun, the public library, which contains 14,000 volumes, the cavalry barracks, the military stores, the promenades, and the great sluices, by means of which the environs can be inundated, are the principal objects of notice. Verdun is famous for its sugar-plums and liqueurs. Cotton and woollen yarn, beer, and leather are also manufactured. *Etain*, a well-built town, 12 miles E. of Verdun, stands on the left bank of the Ornes, a feeder of the Moselle, and has a college, and 2961 inhabitants, who manufacture cloth, hats, cotton cloth and yarn, leather, and lime. *Varennes-en-Argonne*, a small place of 1600 inhabitants, on the left bank of the Air, a feeder of the Aisne, 15 miles W. from Verdun, deserves notice as being the place where Louis XVI., his queen, and two children, in their flight from Paris, were arrested, on the night of the 21st of June, 1791.

The department forms the see of the Bishop of Verdun, is included in the jurisdiction of the High Court and University Academy of Nancy, and belongs to the 3rd Military Division, of which Châlons is head quarters. Under the late monarchy it returned 4 members to the Chamber of Deputies; it now has 7 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1849.)

MEVAGISSEY. [CORNWALL.]

MEW, or rather *Sea-Mew*, a name for the *Gull*. [LARIDÆ.] *Mew*, in falconry, signifies the place where hawks are kept.

MEXICAN ARCHITECTURE. [Mexico.]
MEXICAN STATES. [Mexico.]

MEXICO, a large country of North America, lying between 15° and 42° N. lat., and 87° and 125° W. long. It is bounded S.E. and E. by the Gulf of Mexico, the Bay of Honduras, Belize, and Guatemala; S., S.W., and W., by the Pacific and the Gulf of California; and N. and N.E. by the territories of the United States of North America. It probably occupies a surface of about 1,000,000 square miles.

Surface; Soil; Climate; Rivers.—This immense country is divided by nature into three regions, each of which is marked by different features. The first comprehends the countries lying to the east of the isthmus of Tehuantepec, which is crossed by the meridian of 95° west of Greenwich: we shall call it the Eastern Region. The second extends from the meridian of 95° in a curved line to the mouth of the Rio del Norte on the east (26° N. lat.), and to the most northern recess of the Gulf of California (32° N. lat.) on the west: we call this the Central Region. The Northern Region comprehends the countries situated north of the line drawn from the mouth of the Rio del Norte to that of the Colorado.

The *Eastern Region* comprehends the peninsula of Yucatan, the western declivity of the table-land of Guatemala, the plain of Tabasco, and the isthmus of Tehuantepec. The shores of Yucatan are sandy and flat. The level country extends to a considerable distance inland, whilst the centre of the peninsula is occupied by a long table-land inclosed by two ranges of low hills. The hilly district in the interior, as well as the flat country on the northern coast, has a sandy soil. The hills in the interior grow higher towards the point where the peninsula is connected with the table-land of Guatemala. The larger and higher portion of this table-land belongs to the state of Guatemala, and it is traversed by a ridge of high hills, which stands on a base elevated probably about 5000 feet above the sea.

The plain of Tabasco begins at some distance east of the Laguna de Terminos, and extends westward to Partida Rock, on the shores of the Gulf of Mexico. This plain is more than 250 miles long, and extends inland from 50 to 120 miles. Its surface is a dead level, and the soil alluvial. Being very fertile, it is covered with a thick forest of heavy growth; and it is often inundated. The Laguna de Terminos is about 60 miles long, and 30 miles wide on an average. The plain is watered by a considerable river, the Rio de Tabasco, and its two branches, the Usumasinta and the Grijalva; and it occupies the northern portion and about one half of the isthmus of Tehuantepec. The southern half comprehends a mountain-ridge and a smaller plain. The most western declivity of the table-land of Guatemala assumes the form of a ridge at about 94° W. long. The southern plain of Tehuantepec is about 25 miles wide, and extends along the Pacific from the boundary of Guatemala to some distance west of the town of Tehuantepec. It is watered by the Chimalapa and the Huasacualco.

The *Central Region* of Mexico in its natural features exhibits great variety. The eastern coast is low and sandy, from the Punta de Rocca Partida (18° 40′ N. lat.) to the most north-eastern corner of the Gulf of Mexico (about 29° N. lat), and still farther eastward. North of 22° several rivers of considerable size fall into the sea, but except at their mouths the coast cannot be approached by vessels, as it is lined by long, low, and narrow islands, which lie parallel to, and from two to six miles from it. At the back of the low sandy coast tract the country rises gradually to the foot of an extremely steep ascent, which constitutes the eastern edge of the extensive table-land farther west. The country which lies between the shores and the steep ascent varies in width from 60 to 180 miles; it is comprehended in the Tierras Calientes, or 'hot countries.' The seasons are divided into the winter, or the season of the north winds, and the summer, or season of the breezes. The steep ascent which bounds this tract on the west rises in some places in terraces, which lie between the declivities; and in such places the ascent occupies a considerable space; but in other parts it rises from 5000 to 6000 feet in a distance generally not exceeding ten miles in width, and frequently much less. This steep constitutes the outer edge of the elevated plains of Anahuac, which extend westward to a great distance. The edge itself is lined by a continuous series of hills, two of which rise to heights of 13,415, and 17,373 feet.

The elevated plains of Anahuac are divided into two parts by a range of mountains, which traverses them in a general eastern and western direction, and is called Sierra Madre: it has many summits 10,000 feet high. The elevated plains which spread out west of the steep ascent occupy the greatest part of the surface of Mexico. They are widest between 19° and 20° N. lat., where they occupy 360 miles from east to west. This extensive tract of country however is not one plain, but divided into four plains, unequal in extent, and separated from each other by ranges of hills, which rise from 500 to 2000 feet above their base. These plains are called the Plains of Tlascala, Tenochtitlan, Toluca, and Michoacan; they contain several summits above 15,000 feet high, among which that of Popocatepetl, the highest in Mexico, has a height of 17,884 feet.

From the western edge of the table-land of Michoacan, on which the small town of Zapotlan is built, the country declines rapidly to the plain of Colima, which seems to resemble in most respects the low tract along the Gulf of Mexico. On the north the table-lands border on others of a similar description. On the south the country descends rapidly and with a very irregular surface, except where it borders on the plain of Tlascala. This plain is joined on the south by that of Mixtecapan, which stretches from about 18° 30′ N. lat., southward to the very shores of the Pacific, where it terminates with high mountains, leaving only a narrow tract between them and the sea. This plain, stretching south and north, and extending westward to 98° 30′, forms nearly a right angle with the table-land which stretches east and west over the Mexican isthmus,

between 19° and 20° N. lat. It is watered by the Rio de Zacatula, and contains the volcano of Jorullo.

North of 20° N. lat. is the table-land of Queretaro, which extends to the ridge of the Sierra Madre, on the east to about 21° N. lat., but on the west to 21° 30′. It has within it the rich agricultural district of Baxio, and many productive mines. This table-land descends towards the meridian of Zapotlan, or Zapotlanéjo (102° 30′), where the productions of the Tierras Calientes appear, and the general level of the country, extending to the shores of the Pacific, may be estimated at about 4000 feet above the sea. In this country is the lake of Chapála, which is about 90 miles in length, and from 12 to 18 miles in breadth: the surrounding hills rise to a considerable elevation, and descend rapidly to the water's edge. The lake contains the island of Mescála.

The Rio Santiago, or Rio Grande, the largest of the rivers of the Mexican isthmus, principally traverses the regions just mentioned, having its mouth at S. Blas (21° 32′ N. lat., and 105° 18′ W. long.). This river rises in the highest of the table-lands, in that of Toluca, in a lake situated at the base of the range which divides this table-land from that of Tenochtitlan; it flows through the plain of Queretaro, the Baxio, and the lake of Chapála, to the Puente del Rio Grande, near Guadalaxara, where there occur in the space of less than three miles between fifty and sixty falls. The course of this river considerably exceeds 400 miles in length. The eastern part of the table-lands is drained by the river Panuco, which rises in the lake of Zumpango on the table-land of Tenochtitlan, and has a course of nearly 400 miles through a very diversified country.

The climate of these table-lands varies in proportion to their elevation above the sea. In those of Tenochtitlan and Tlascala, which are nearly equal in this respect, the mean annual temperature is 62°. On the table-land of Toluca, which is the most elevated, the air is so cold, during the greatest part of the day, that the thermometer generally varies between 42° and 46°. On the table-land of Valladolid, Mixtecapan, and Michoacan, which are considerably lower than Tenochtitlan, the mean annual temperature probably varies between 66° and 68°. The seasons on the table-lands are only two, that of the rains (estacion de las aguas), and the dry season or summer (el estio). The countries which are elevated from 2500 to 4000 feet above the sea-level are called Tierras Templadas. Their mean annual temperature amounts to between 75° and 78°, and they enjoy nearly a continual spring, as the difference of the temperature in the colder and hotter season does not exceed 8°, or at the utmost 10°.

We pass to the countries lying to the north and east of the Sierra Madre. The country which is bordered by this range on the south and west, is a plain of great length, terminating on the north on the banks of the Rio del Norte, between 30° and 32° N. lat., and at the Sierra de las Espuelas, the most northern offset of the Sierra Madre. Its length is nearly 700 miles.

Its width varies from 100 to 300 miles. It has a general elevation of from 3000 to 6000 feet. It is traversed by ridges of low hills, and is mostly occupied by pasture-ground; it is watered by the rivers Conchos, Del Norte, Nieves, Nasas, Buenaventura, Las Casas Grandes, and others. The Sierra Madre, which extends along the western side of this plain in a north-western direction, lowers towards it with a gradual descent. The country between the Sierra Madre and the Pacific is naturally divided into two different regions, the plains of Cinaloa and the hilly region of Sonora. The former extends between 24° and 28° N. lat., and the latter between 28° and 32° N. lat. The plains are perfectly level, and only hills of moderate elevation divide them from the Sierra Madre. Through these plains flow the rivers Culiacan, Del Fuerte, Mayo, Yaqui, Babispe, Oposura, Arispe, Dolores, Ignacio, and several others, some of which have courses of 100 to 200 miles.

Northern Region. — The countries hitherto described are situated on the Mexican isthmus, which is divided from the main body of North America by a plain extending from the shores of the Pacific eastward to the lower course of the Rio del Norte, between 32° and 33° N. lat. This plain is crossed by two mountain groups, those of Arizona and Florido; and it is drained by the river Gila, which has a course of more than 500 miles.

The Mexican States (according to the old political division) extend much beyond this natural boundary, and comprehend a considerable portion of the mainland of North America, namely, the two Californias; the unknown region extending between Upper California and the Rocky Mountains; the Vale of the Rio del Norte, or New Mexico; and Texas, or the country extending east of the Rocky Mountains. Of California, the principal circumstance necessary to be here noted, supplementary to the article CALIFORNIA, is the discovery of gold mines in that region in 1848. The gold region is supposed to extend from 38° to 39° N. lat., and from 121° to 122° W. long. TEXAS is described under a separate article. New Mexico is all that remains to describe here. It now belongs to the United States. By a treaty of peace between Mexico and the United States, May 19, 1848, it was settled that the boundary line which divides the United States on the N.E. and E. from Mexico, should follow the course of the Rio Grande del Norte, from its mouth, to the southern boundary of New Mexico, or 34° N. lat., thence westwards to the river Gila, and along that river to its entrance into the Rio Colorado, and thence in a straight line to a point one marine league S. from the port of San Diego on the Pacific; and this last line divides Upper or New California, which now belongs to the United States, from Lower or Old California, which belongs to Mexico.

New Mexico is a valley of great extent, bounded by the river Arkansas, 39° N. lat., and S. by the Rio Rojo, or Red River, 34° N. lat.; and including the two mountain-ranges with which the Rocky Mountains terminate on the south. The western range, called Sierra de Mogollon,

commences about 34° N. lat., and is in the plain which lies along the upper course of the Rio Gila. The other range, called Sierra del Sagramento, rises farther east, near 29° N. lat., and extends northward to 40° N. lat., where it joins the Sierra de Mogollon. Both ranges run nearly parallel to one another from 34° to 40° N. lat., and the long longitudinal valley between them is New Mexico. Its southern district, between 34° and 35° 30′ N. lat., is a desert, covered with arid hills: it is called Deserto del Muerto. The northern district, between 35° 30′ and 37° N. lat., is a valley, from 20 to 40 miles across: this part has been settled, and produces grain enough for the consumption of the population. But the greatest wealth of the people consists in their pasture-grounds, which feed numerous herds of sheep, their plantations of tobacco, and the wild animals which inhabit the adjacent mountains. The valley is watered by the Rio del Norte, called in its lower course Rio Grande del Norte, the largest of the rivers of Mexico. Humboldt estimates its course at nearly 1400 miles. It rises in the most northern angle of the Vale of New Mexico, near 40° N. lat., not far from the sources of the Arkansas and the Colorado; it flows into the Gulf of Mexico, after receiving the waters of the Conchos, the Puerco, and other rivers. New Mexico, although a valley between two ranges of mountains, has an elevation of 2500 feet above the level of the sea.

Productions.—As there is so great a difference in the climate of the different regions of Mexico, there must be a corresponding variety in their productions. Humboldt asserts that within these states almost all the vegetable productions may be grown which are found between the equator and the polar circle. Any enumeration of them here would therefore be unnecessary. The agriculture of the table-lands does not supply any article for exportation. Cotton is grown along the shores of the Pacific, and in the valley of the Rio Nasas, in a deep depression of the northern table-land; and coffee on the eastern coast, west of the town of Vera Cruz; sugar is cultivated in many places, and a considerable quantity is exported; cocoa is collected in the low country along the river Huasacualco; and indigo along the southern coast, but only for home consumption. Tobacco, which in many parts succeeds very well, is only permitted to be grown in certain places.

All the domestic animals, which have been brought over from Europe by the Spaniards, have multiplied greatly in Mexico, owing to the wide tracts which are not or cannot be cultivated, and which afford pasture-ground for nine or ten months of the year. Cattle is abundant, both on the table-lands and the lower tracts. Jerked beef and horns are exported. Sheep are numerous on the table-lands, especially on the northern, which are much drier; and wool is an article of exportation. Horses abound generally. Horses and mules are exported in great numbers to the United States. On the great plains bordering on the Red River and the Arkansas the American buffalo abounds. Carnivorous wild animals are not numerous. Game is abundant, especially deer and hares. The cochineal insect is reared wit great care on the table-land of Mixtecapar whence by far the greatest part is brought to th markets of the world.

Mexico is noted for its mines of gold and silve The gold mines occur chiefly on the western sid of the Sierra Madre, north of 24° N. lat.: th silver mines are richest on the mountains whic rise on the table-lands, and in those which borde their margin. Besides the precious metals, Mexic has abundance of copper, iron, and lead, whic are worked. The iron mines however have onl been opened since the year 1825. A quicksilv mine is worked at S. Onofre, on the norther declivity of the Sierra Madre. The carbonate soda, which is necessary for the smelting of t silver ore, is collected in several lakes, where it found crystallized on the surface in great abu dance.

Inhabitants.—The population of these states composed of creoles or descendants of Europear of Indians or natives, and of those of mixed bloc The number of Europeans formerly amounted 80,000, but has been much reduced by the exp sion of the natives of Spain; and though ma individuals of other nations have since settled these states, it is supposed that the whole nu ber of Europeans hardly amounts to more th 20,000 or 25,000. The bulk of the populati still consists of the descendants of those natio which inhabited the country at the time of t Spanish invasion. The aboriginal tribes America resemble one another in the princi features of their face and body; but they spe languages or dialects which differ greatly. T number of tribes which are still entirely in pendent, and live north of 33° N. lat., is known, and seems to be very great. The l guage which is most extensively spoken is t of the Aztecs, which seems to be understood nearly all the tribes which inhabit the coun between 18° and 23° N. lat. The natives v have submitted to the dominion of foreigners h attained different degrees of civilization. T Aztecs were a very interesting race of aborig Mexicans. The *Indios Bravos*, or savage tri inhabit the countries north of 33° N. lat., al the Rio Gila, the Bolson de Mapimi, the mo tain-ranges which include the vale of the Rio Norte and the north-western district of Te Many of them, especially the Appaches Comanches, the most numerous of the tri were and still are at open war with the w settlers.

The mixed race is mostly composed of descendants of Europeans and the aborig tribes: these are called *Metis*, or *Mestizos*, constitute more than one-fourth of the popula The descendants of Africans and Indians, an Africans and Europeans, are much fewer. former are called *Zambos*, and the latter *Mulo* There are very few negroes in this country.

The whole population, which probably present considerably exceeds seven million composed of these different elements, accor to a rough estimate, in the following pr tions:—

Aboriginal nations	3,500,000
Mestizos	2,000,000
Mulattos and Zambos	600,000
Creoles, or descendants of Spaniards	1,200,000
Europeans	25,000
	7,325,000

Political Division and Towns.—The confederation called the United Mexican States consisted, before the recent war and treaties with the United States, of nineteen republics or states, besides three territories, and an immense tract of country which has not been annexed to any of them. According to an estimate, the states contained the following number of inhabitants and extent in square miles:—

	Population.	Extent in sq. miles.
1. Chiapa	130,000	38,500
2. Yucatan	520,000	48,500
3. Tabasco	55,000	10,500
4. Oaxaca	600,000	34,500
5. Vera Cruz	250,000	22,000
6. Puebla	820,000	21,000
7. Mexico	1,200,000	30,000
8. Michoacan	450,000	26,500
9. Xalisco	800,000	74,500
10. Guanaxuato	450,000	8,600
11. Queretaro	230,000	15,500
12. S. Luis de Potosi	220,000	17,500
13. Zacatecas	275,000	18,500
14. Durango	200,000	56,500
15. Occidente	180,000	148,000
16. Chihuahua	120,000	72,500
17. Cohuila, with Texas	46,000	136,500
18. Nuevo Leon	85,000	20,000
19. Tamaulipas	60,000	40,000
	6,691,000	833,600

To these states were added—

	Population.	Extent in sq. miles.
1. New Mexico	45,000	45,000
2. Lower California	4,000	30,000
3. Upper California	325,000	600,000
	374,000	675,000

The recent political changes in Mexico render it unnecessary to describe these states as separate republics. The chief towns are therefore mentioned in connection with each state, or department.

1. The state of Chiapa comprehends the whole of the western declivity of the table-land of Guatemala, as far as it belongs to the Mexican States. It contains *Ciudad de las Casas*, a town of 4000 inhabitants, with a Catholic College; *Chamula* (6000); *S. Bartolomeo de los Llanos* (7500); *Commitan* (6000); and *Tuxtla* (4500).

2. The state of Yucatan comprehends the peninsula of that name as far south as 18° N. lat. It contains *Merida*, with 28,000 inhabitants, situated on an arid plain about twenty-five miles from the sea; *Valladolid* (3000); *Salamanca de Balcar* (2000); and *Campeachy*.

3. The state of Tabasco extends over the greater part of the low plain, from the Laguna de Terminos on the east to the Rio de Huasacualco on the west. It contains *Villa Hermosa*, with 8000 inhabitants.

4. The state of Oaxaca extends over the whole of the table-land of Mixtecapan, and is rich in agricultural products. The capital, *Oaxaca*, which contains 40,000 inhabitants, is built in a depression of the table-land, 4800 feet above the sea-level. It is well built, has fine houses, squares, and aqueducts, and contains some manufactures of sugar, chocolate, and silk. The state also contains *Tehuantepec* (7000); and the extensive ruins of *Mitla*.

5. The state of Vera Cruz comprehends the whole coast of the Gulf of Mexico, from the river Huasacualco on the south-east, to that of Panuco on the north-west. The capital is VERA CRUZ. The other towns are *Alvarado; Huasacualco; Tampico* (4000); *Cordova* (3000); *Orizava* (3000); and *Xalapa*, a fine healthy town, with 13,000 inhabitants.

6. The state of Puebla comprehends by far the greatest portion of the table-land of Tlascala, and also a considerable portion of lower country. It contains the town and remarkable ruins of *Cholula;* the capital, *Puebla*, with 50,000 inhabitants, a magnificent cathedral, and many churches and convents; *Tehuacan* (10,000); *Tlascala* (4000); and *Huamantla* (3000).

7. The state of Mexico comprehends the two table-lands of Tenochtitlan and Toluca, and a great extent of neighbouring country. It contains the capital, MEXICO; *Tezcuco* (5000); *Chalco* (3000); *Toluca* (12,000); *Zimapan* (9000); the harbours of *Acapulco* [ACAPULCO], and *Zacatula;* extensive ruins near *Tezcuco, Teotihuacan*, and *Cuernavacca;* and valuable mines in various parts.

8. The state of Michoacan extends over the whole of the table-land of Michoacan and the low country lying between it and the Pacific. It contains *Valladolid*, with 25,000 inhabitants, and a noble cathedral; *Patzcuaro* (6000); *Tzintzontzan* (2500); *Zamora* (6000); *Cuisco; Tlalpujahua* (9000); and several rich mines.

9. The state of Xalisco comprehends the whole of the hilly region of Xalisco, and the lower country between it and the Pacific. It contains *Guadalaxara*, the second city of Mexico, with a fine cathedral, fourteen squares, twelve fountains, many churches and convents, several good streets, a beautiful alameda or public walk, and 60,000 inhabitants; *Lagos* (15,000); *Tepic* (7000); *San Blas*, the chief port (3000); and the small towns and harbours of *Tequila, Navidad*, and *Guatlan*.

10. The state of Guanaxuato comprehends the western districts of the table-land of Queretaro, a part of the Sierra Madre, and a tract north of that range. It contains *Guanaxuato*, in the midst of a rich mining district [GUANAXUATO]; *Zelaya* (10,000); *Salamanca* (15,000); *Irapuato*

(16,000); *Villa de Leon* (30,000); and some smaller towns.

11. The state of Queretaro extends over the eastern portion of the table-land of Queretaro, and over a considerable part of the plain north of the Sierra Madre. It contains *Queretaro*, with 40,000 inhabitants, and some fine churches; *Cadereita*; and productive silver mines.

12. The state of S. Luis de Potosi comprehends by far the larger part of the southern portion of the great northern plain. It contains *S. Luis de Potosi*, a well-built town, with 40,000 inhabitants; and a rich mining and agricultural district.

13. The state of Zacatecas extends on both sides of the Sierra Madre. Its mines are very productive; and it contains the towns of *Aguas Calientes* (35,000), *Zacatecas* (28,000), *Sombrerete, Freznillo, Ierez, Pinos*, and *Nochistlán*.

14. The state of Durango includes the Sierra Madre from 24° to 27° N. lat., and an extensive level tract in the east. It contains *Durango* (22,000); *Nombre de Dios* (7000); *Papasquiaro* (6000); *S. Juan del Rio* (10,000); and *Villa de los Cinco Señores*.

15. The state of Occidente comprehends the whole tract extending between the Sierra Madre and the Gulf of California from 23° to 33° N. lat. It contains *Rosario* (6000); the harbour of *Mazatlan*; *Cosalá* (5000); *Culiacan* (11,000); *El Fuerte* (5000); *Los Alámos* (6000); *Santa Cruz* (10,000); *Guaymos*, an excellent port in the Pacific (3000); *Pitic* (8000); *Arispe* (3000); several productive gold and silver mines, and some interesting Aztec ruins.

16. The state of Chihuahua comprehends part of the northern plain, together with the mountain region of the Bolson de Mapimi, and a tract of country south of it. It contains the capital, *Chihuahua*, a well-built but decaying town (12,000); *S. Bartolomeo*, a commercial town (28,000); *El Parral* (7000); *Parras*; and numerous mines and ruins.

17. The state of Coahuila extends over the north-eastern portion of the northern plain and over a neighbouring plain. The country of Texas used formerly to constitute part of this state. [Texas.]

18. The state of Nuevo Leon lies almost entirely to the east of the table-land, in the lower region which extends from it to the Gulf of Mexico; it contains *Monterey* (15,000); and *Linares* (4000).

19. The state of Tamaulipas extends along the Gulf of Mexico from the mouth of the river Panuco to that of the Rio del Norte, and still north of the latter to the Rio Nueces. It contains *Pueblo Nuevo de Tamaulipas*, a modern and rapidly-increasing town; *Matamoros* (3000); and several smaller harbours.

Manufactures and Commerce.—Before the Revolution (1810) there were many flourishing manufactures in Mexico, the annual produce of which amounted to from eight to ten millions of Spanish dollars, or about two millions of English money. The most considerable were those of cotton and wool in the towns of Puebla, Cholula, Tlascala, Queretaro, Lagos, Guadalaxara, and Tezcuco. The manufactures of soap, leather, and saddlery wer also considerable. The manufacturers owed the prosperity to the high price at which, under system of monopoly, European goods were sold i that country. After the harbours were throw open to a free trade (in 1820) the manufacture began to decline, and are now much diminished.

The commercial intercourse between the coa and the table-lands is difficult on account of th steep ascent to the table-lands from the coas Even in those parts where there is no obstacle the use of carriages, the goods are common carried by mules, on account of the great numb of these animals, and the low price at which the are bought.

The maritime commerce is considerable. I the beginning of the present century the export according to Humboldt, amounted to 22,000,00 of Spanish dollars, and the imports to 15,000,00 of dollars. Between 1820 and 1830 howev the exports considerably diminished, on accou of the comparatively small produce of the mine the precious metals constituting the princip article of exportation. The coinage of gold an silver in Mexico in 1845 amounted to 15,141,8 dollars. The total exports are estimated at abo 20,000,000 dollars, of which 18,000,000 are precious metals. The British and Irish produ exported to Mexico in 1846 was valued 303,685*l*.

The commerce is mostly carried on in forei vessels, as these states have a comparatively sm number of merchant ships.

Architectural Antiquities. — The aborigin architecture of Mexico resembles that of Egy not only in the vast scale and massiveness of monuments, but in the application of the pyram or of forms composed of it. Pyramids not inferi to those of Egypt, and some of even still larg dimensions in their plan or base, exist in t Mexican territories; and examples of the seco class occur in pyramid towers, consisting of series of truncated pyramids placed one abo another, each successive one being smaller th the one on which it immediately rests, so that stands upon a platform or terrace. The pyram tower of Cholula resembles in no small degree t temple of Belus, as described by Herodotus, in much as it consists of eight stories, each formi a platform on which stands the one above [Cholula.]

Some of these edifices appear to have been r temples only, but to have contained sepulch chambers and apartments for the priests; th had also descending galleries leading down i caverned recesses or halls.

At Teotihuacan, about eight leagues to north-east of the city of Mexico, are an immen number of pyramids, several hundred small o ranged in files or lines, and two larger ones c secrated to the sun and moon. Each of the lat is divided into four platforms, the slopes betwe which consisted of steps, and on the summit w a colossal stone statue covered with plates of go which were stripped off by Cortes's soldiers, a the statues themselves destroyed.

Besides monuments which are chiefly works

magnificence, others exist which attest the high degree of civilization attained by the aboriginal nations of Mexico, such as Cyclopean roads and bridges. The former of these were constructed of huge blocks of stone, and frequently carried on a continued level, so as to be viaducts across valleys. There are also throughout Central America numerous excavations or rock-hewn halls and caverns. They resemble the Cyclopean fabric near Argos known by the name of the Treasury of Atreus, are generally dome-shaped, and the central apartment is lighted through an aperture in its vault.

History.—Though Columbus in his last voyage approached the peninsula of Yucatan, he did not come in sight of it. Thirteen years later (1517) the peninsula was discovered by Francisco Hernandez Cordova, who sailed along the coast from Cape Catoche to Campeachy Bay. The following year Juan de Grijalva continued the discoveries along the same coast northward to the mouth of the Rio Panuco; he visited the islands of Sacrificios and S. Juan de Ulua. His account of the wealth of the country excited the desire of conquest. In 1519 Hernan Cortes landed at the place where Vera Cruz now stands; and with his little army he soon ascended the table-land, the numerous inhabitants of which he found united under a powerful sovereign, the king of the Aztecs, Montezuma. Within the limits of this empire there were some small republics, of which that of Tlascala united with Cortes. Cholula was also a republic, and the name of a third is preserved, that of Huajocingo. After the conquest [AZTECS; CORTES], Mexico became a kind of colony to Spain, governed by officers sent from the mother country. Numerous Spaniards settled in the country; and in the course of three centuries there grew up many mixed races, who spread themselves throughout this vast region.

By the intrigues of Bonaparte in 1808, the royal family were compelled to abdicate the throne of Spain, and he conferred the whole Spanish monarchy on his brother Joseph, then king of Naples. The Spaniards in Mexico and the Creoles were unanimous in declaring their resistance to the government established by the French. The viceroy could no longer receive orders from Spain, and it was necessary to organise a government which should act independently under a certain sanction, and with authority. But as to this point they disagreed. The Creoles wished to establish a national representation; the Spaniards opposed the measure, and prevented the establishment of a system of national representation for Mexico. The Creoles submitted: but the public mind had been agitated by the discussions which had taken place, and soon afterwards, in 1810, the natives and the mestizos rose against the government. From that year till 1820 there was a constant succession of wars between the government and the advocates of liberalism, which terminated in favour of the government.

The events which occurred in Spain in the beginning of 1820 suddenly changed the aspect of affairs, and deprived Spain of the most valuable of her possessions in America, which it had regained at the cost of much blood and money. The Spaniards and the Creoles, who had formerly made common cause, were now divided into two parties, royalists and constitutionalists. Iturbide, a clever and ambitious Creole, played one party against another with such tact, that he got himself proclaimed by the army Emperor of Mexico, on May 18, 1822. He was acknowledged by the Mexican Congress, which had been opened on the 24th of February; but a struggle for power soon arose between Iturbide and the congress, which the Emperor terminated by dissolving the assembly in the same manner as Cromwell dissolved the Long Parliament, on the 30th October, 1822. On the same day he formed a new legislative assembly, composed of persons favourable to his wishes and intentions. But he had not skill enough to reconcile his companions in arms to these changes. Several generals declared against his proceedings, and prepared for resistance. Iturbide, terrified at the storm which was ready to burst on all sides, called together the old congress, abdicated in March 1823, and went to Europe, whence however he returned to Mexico in 1824. He had been outlawed by the congress, and upon landing on the coast, he was shot at Padilla, in Tamaulipas. Thus Mexico obtained its independence and a constitution, without a civil war, and became a republic, which it has remained ever since.

The frequent revolts of the inhabitants of Texas against the Mexican government, and the disposition shown by the United States of America to foster this revolt, gradually involved the two republics in hostilities. The American senate, in March 1845, rejected by only a small majority a proposition for annexing Texas to the United States; and in June of the same year, the Mexican government called upon its subjects to arm in defence of the national cause. This was followed, in July, by an agreement on the part of the inhabitants of Texas to the project of annexation with the United States. Before the end of the same year, Yucatan revolted from the Mexican government.

The war between Mexico and the United States of North America commenced April 24, 1846, near the mouth of the Rio Grande del Norte, on a dispute as to the boundary between Mexico and Texas, and terminated Sept. 15, 1847, by the capture of the city of Mexico by the American army under General Scott. The terms of a treaty were then negotiated, and were agreed to by the Mexican Chamber of Representatives in May 1848. By this treaty New California and New Mexico were given up to the United States, and the boundary line between the two countries fixed as before stated.

MEXICO, the capital of the Mexican States, is situated in 19° 25′ N. lat., and 99° 10′ W. long., 7468 feet above the level of the sea. It stands nearly in the centre of an extensive plain, called the Vale of Tenochtitlan, which was the name given to the town before the year 1530. This vale has an oblong form, extending from S. to N. 52 miles, and from E. to W. 34 miles. About one-tenth of its surface is occupied by four lakes. The largest of these lakes, that of Tezeuco, covers

a surface of 77 square miles; the lake of Chalco contains a small island and the pleasant village of Xico; the lake of St. Christoval covers about 27 square miles; the lake of Zumpango occupies about 10 square miles, and is divided into two portions by a dyke; the eastern is called the lake of Coyotepec, and the western that of Zitlaltepec. To carry off the superfluous waters from the vale, a canal has been made through the mountains of Nochistongo, which lie north-west of the Lake of Zumpango. This stupendous work, known by the name of the Desague of Huehuetoca, is above 12 miles long, and for more than 1000 yards is cut through rocks from 60 to 75 feet high. It is justly considered one of the most astonishing hydraulic works in the world.

The mountains which inclose the vale are lowest on the north side, where they rise only a few hundred feet above the level grounds of the vale, but some of those on the other sides attain a height of 15,000 to 18,000 feet above the sea-level.

Mexico is one of the finest cities in the world. The streets are very wide, and at right angles to each other. They are all well paved, and have side-walks of flat stones. The private houses, though spacious, are rather low, seldom exceeding one story; but, being constructed either of amygdaloid or porphyry, they have an air of solidity and even of magnificence. The roofs of the houses are flat, and they sometimes communicate with one another for a considerable distance, and when seen from an elevation they look like immense terraces. The houses are all squares, inclosing open courts, which are surrounded by corridors. The entrance leads through a large gate into the court, and the stairs are opposite to the gate. The best apartments, which are generally painted, are towards the street, and all the windows are ornamented with balconies.

The squares are spacious, and generally surrounded by buildings of hewn stone in a good style of architecture. The principal square is the Plaza Mayor, which, on two sides, is surrounded by the cathedral and the palace, and on the two other sides by shops and dwelling-houses, with the exception of the Casa del Estado, or the palace of Cortes. This square is the market for vegetables and fruits; but manufactured goods are sold in the Portales, or covered colonnades, of which there are several on a large scale, and all well supplied with goods from Europe and China. Several principal shops open into the Portales, and innumerable petty venders display their wares, crowded on tables, in boxes, and in baskets. The Parian, or bazaar, is a square building, divided into uniform compartments by two principal cross streets, and others subdividing it. The palace is a building of great extent, including a number of squares and inner courts, with separate staircases and suites of apartments. The College of Mines is a large edifice, which contains a rich collection of minerals, and in one of its rooms a professor gives lectures on chemistry and mineralogy. The Acordada, or chief prison, the hospital, the university, and the Academy of Arts, are all large buildings. The numerous churches and convents, with their cupolas and steeples, give the town a magnificent appearance. The cathedral stands on the ruins of the great Teocalli, or temple of the god Mixitli. The interior is lofty, magnificent, and imposing.

The Alameda, or public walk, at the western extremity of the town, resembles a park; it is laid out in lines, diverging from different centres, and is planted with a great variety of trees. The city is supplied with water by two aqueducts from the mountains. The provisions and vegetables are generally brought by small boats over the lake of Tezcuco and the canal of Iztapalapan, which leads from the lake of Xochimilco to the town.

The population of the city of Mexico amounts to between 140,000 and 150,000, and consists mostly of Creoles, or descendants of Spaniards, the Mestizos, or descendants of Spaniards and Indians not amounting to half that number. The lowest class of the people live in a state of abject poverty. There are a few manufactures in the city, but most manufactured goods are imported.

MEXICO, GULF OF, is a mediterranean sea united by numerous straits with the Atlantic from which it is separated by a row of islands and widely extended banks. The long chain of the Antilles forms its eastern boundary between 10° and 20° N. lat.; and several small banks, with the Great and Little Bahama Bank, extend along it from 20° to 26° N. lat. It is divided from the Pacific Ocean by the Mexican isthmus, which unites the two Americas. The length of the whole sea from east-south-east to west-north-west, is not much short of 3000 miles. It is divided into two portions by the island of Cuba, which lies across the sea from east to west. Of these portions the southern, in modern times, has obtained the name of the Caribbean Sea, whilst that of Gulf of Mexico has been limited to the northern portion.

The Caribbean Sea, which extends from east to west nearly 2000 miles, with an average breadth of less than 500 miles, is (west of 80° long.) lined by numerous reefs and low wooded islands, called keys, which in the Mosquito Gulf and the Bay of Honduras increase in number, and render navigation more intricate and dangerous. The Gulf of Mexico, or the northern portion of the mediterranean sea, is united to the Caribbean Sea by a strait about 120 miles wide, which runs between Cuba and Yucatan. The length of the Gulf, from Cape Sable in Florida to the eastern coast of Mexico, is more than 1000 miles, and its breadth toward the west more than 700 miles; but between Yucatan and Cuba on the south, and the shores of Louisiana and Alabama on the north, it does not exceed 550 miles.

The navigation of these seas varies greatly in facility in different parts. The eastern trade winds prevail during the summer from May to November, and on its eastern border along the islands all the year round. In the Gulf of Mexico the Nortes, or northern gales, are much dreaded by navigators. The currents in this sea are mostly independent of the change of winds. A strong current sets into the Caribbean Sea from the Atlantic; but the direction of the various currents is afterwards determined by the peculiar curvatures of the Gulf.

The Gulf of Mexico is remarkable for the high temperature of its waters. It raises the thermometer to 86°, while in the Atlantic, between the same parallels, the water does not exceed 77° or 78°.

MEYER, FELIX, was born at Winterthur, in the canton of Zürich, in the year 1653. He studied first under a painter at Nürnberg, and afterwards under Ermels. He first acquired a reputation by his frescoes in the abbey of St.-Florian, in Upper Austria. He was afterwards constantly employed by the nobility of Germany. His most esteemed works have figures by Roos or Rugendas. He died in 1713.

MEYER, HEINRICH, a German designer and painter, and writer on art. For forty years Meyer was Goethe's consulting and confirming oracle in all opinions on art, and was the author of portions of the critical parts of Goethe's publications on art, as 'Kunst und Alterthum,' 'Winckelmann und sein Jahrhundert,' 'Propyläen,' 'Farbenlehre,' &c.

Meyer was born in 1759 at Zürich, and was for some years the pupil of J. C. Füssly there. In 1797 he established himself at Weimar. He held, from 1807, the office of director of the academy there, and enjoyed the titular rank of Hofrath. He was the principal editor of the complete edition of the works of Winckelmann, which were published in 8 vols. at Dresden between 1808 and 1820; the notes on which he afterwards arranged and connected into the 'Geschichte der Bildenden Künste bei den Griechen,' 2 vols. 8vo., Dresden, 1824. A third volume, being the continuation of the history of Greek art in Rome, was edited by Dr. F. W. Riemer, after the death of Meyer, under the title 'Geschichte der Bildenden Künste bei den Griechen und Römern,' 1 vol. 8vo., Dresden, 1836. As a painter Meyer produced little. His principal work is a painted frieze, in the palace at Weimar, an allegory of human life, represented by children.

MEZE. [HE'RAULT.]

MEZEN. [ARCHANGEL.]

ME'ZERAI, FRANÇOIS EUDES DE, was the son of a surgeon named Eudes, and born in 1610, near Argentan, in the village of Rye. He studied in the university of Caen, and at Paris took the name of De Mezerai. At Paris he produced his 'History of France.' He also published several pamphlets directed against Cardinal Mazarin, under the name of Sandricour. An abridged edition of his 'History of France' appeared in 1668, and in 1662 his 'History of the Turks,' which is a translation from Chalcondylas. He succeeded Voiture in the Academy, and died in 1683.

MEZEREON. [DAPHNE.]

MEZIE'RES. [ARDENNES.]

MEZIN. [LOT-ET-GARONNE.]

MEZZOTINTO, a peculiar mode of engraving designs of any description upon plates of copper or steel. In this style of engraving, which essentially differs from every other, the surface of the plate is first indented or hacked all over by the action of an instrument something like a chisel, with a toothed or serrated edge, called a *cradle*, or mezzotinto *grounder*. This tool, being rocked to and fro in many directions, indents or barbs the plate uniformly over its face, and produces what is called the mezzotinto grain or ground. The barb or nap thus produced retains the printing-ink; and if in this state of preparation an impression were taken from the plate upon paper, it would be uniformly of a deep black colour.

The mezzotinto ground having been laid, the business of the artist properly commences. Having traced or drawn, with a pencil or other instrument, his outline upon the paper (unless indeed, as is sometimes the case, this should have been etched by the ordinary process previous to the mezzotint ground having been laid), he proceeds to cut away the nap or ground, in conformity with the design, from all those parts which are not intended to be perfectly black in the impression. The instruments required for this purpose are *scrapers* and *burnishers*. With the former he scrapes away more and more of the ground in proportion to the brightness of the light, and the burnishers are used to produce perfect whiteness where it is required, as the high lights on the forehead or tip of the nose, or white linen in a portrait, &c. As the work proceeds it may be blackened with ink, applied with a printer's ball or otherwise, to ascertain the effect; after which the scraping may be again proceeded with, the artist taking care always to commence where the strongest lights are intended to appear.

The great facility with which mezzotintos are executed, as compared with line-engravings, will be obvious, seeing that it is much easier to scrape or burnish away parts of a dark ground corresponding with any design sketched upon it, than it is to form shades upon a white ground by an infinite number of strokes, hatches, or points, made with the graver or etching-needle. Herein consists the leading difference between this and all other modes of engraving; for, while the process in each of these is invariably from light to dark, in mezzotinto it is from dark to light; and even the very deepest shades are produced, as we have seen, before the design is commenced. The characteristic or distinguishing excellence of mezzotinto engraving would seem to consist in the rich profundity of its shadows, and its chief defect seems to be a corresponding poverty in the lights. Lithography has of late years, in a great degree, superseded mezzotint. There has been much controversy as to the inventor of mezzotinto engraving. It has generally been ascribed to Prince Rupert; but the real inventor of this art was Louis von Siegen, a lieutenant-colonel in the service of the Landgrave of Hesse Cassel, from whom Prince Rupert learned the secret when in Holland, and brought it with him to England, when he came over a second time in the suite of Charles II. Some curious and very rare prints purchased on the Continent, and now deposited in the British Museum, have placed the claims of Von Siegen beyond doubt.

MHEYSIR. [HINDUSTAN, p. 203.]

MIASMA is a Greek word (*μίασμα*) signifying

pollution or corruption generally; and is employed to designate a certain volatile deleterious principle, arising either from the bodies of the sick, from animal or vegetable substances, or from the earth, and capable of exerting a morbid influence on those exposed to its action. To the terrestrial emanations the Italians have given the name of Malaria (from *mala* and *aria*, bad air), and this word has been generally adopted into other languages: to those emanations arising from the bodies of the sick, the term Contagion is more properly applied. In common language, then, miasma is seldom employed to designate the contagious effluvium of disease; but, with the adjunct marsh, is restricted to the sense in which malaria is used; hence we speak of Marsh Miasma and Malaria as one and the same thing. Though marshes, whether salt or fresh, are prolific sources of malaria, they are by no means the only sources; the mud which is left by the drying of extensive ponds and lakes, the half-wet ditches of fortifications, and neglected sewers and drains, are capable of furnishing this poison. The decomposition of vegetable matter, in other circumstances than in connection with soil, is likewise capable of producing it: this has been exemplified in the sickliness of ships from the leakage of sugar into a damp hold. The great agents in developing malaria are moisture and vegetable matter exposed to a high temperature. Of the chemical and physical properties of malaria nothing is known: even the very obvious question whether it is always the same kind of poison, or whether a multiplicity of these may not exist, is one which the present state of our knowledge does not enable us to answer. The effects of malaria manifest themselves in a longer or shorter period after exposure to its influence, and consist chiefly in the production of intermittent, remittent, and yellow fevers, dysentery, and typhus. The long-continued application of the same poison in a diluted form gives rise to various disorders of minor import, gradually undermines the constitution, and produces premature old age. The most efficient means of preventing the generation of the malarious poison, and, by consequence, the diseases to which it gives rise, are, the draining of swampy lands, and preventing the accumulation of putrid or putrescible vegetable or animal matter.

MIAZZI, GIOVANNI, born at Bergamo, in 1699, was originally brought up to his father's trade of carpenter, but became an architect. One of his later and best works is the church of S. Giambattista at Bassano. He also built the collegiate church at Schio, that at Valdagno, another at San Vito, and a fourth at Simonzo, besides that at the convent of Monte Gargano, at Puglia. The Spineda palace, at Venegazza, in the Trevegiano, excited much admiration for the elegance of its design. The beautiful theatre at Treviso is another of his works. Miazzi died about 1780.

MICA, a mineral which usually occurs in thin plates, semi-transparent, and of a peculiar lustre. It consists chiefly of silica and alumina, with small proportions of potash, lithia, and other substances.

MICA SCHIST, one of the earliest groups of stratified rocks known to geologists, and very extensively distributed throughout the mountain regions of the globe, often in contact with granite but more frequently superposed on gneiss. It is frequently interstratified with gneiss, primary limestone, quartz rock, chloritic schist, and clay slate, and is deficient in organic remains. To the British geologist the southern Highlands of Scotland and the mountains of Donegal offer abundant and striking examples of mica schist, with its associated limestones, quartz rocks, &c.

Mica schist, in its most typical state, differs from gneiss by the absence of felspar. The mica is usually spread through the early stratified rocks in continuous surfaces, overspreading the quartz portions, whereas in gneiss this seldom happens. In respect of the magnitude, relative abundance and crystalline aspect of the ingredients of mica schist, there is every possible variation, so that some specimens approach obscurely to granite, others to well defined gneiss, and others to clay slate.

MICAH, one of the twelve minor Hebrew prophets, is called in the title to his prophecy the Morasthite, and thus he is distinguished from Micaiah, the son of Imlah, who prophesied the death of Ahab, about B.C. 897. From the title to the book of Micah we learn that he prophesied in the days of Jotham, Ahaz, and Hezekiah, kings of Judah, or from 759 to 699 B.C. Micah prophesied both to Israel and Judah (i. 1). The canonical authority of this book is undisputed. One of the most remarkable predictions in it is quoted in the New Testament as being understood by the Jewish priests and scribes to refer to the birth of the Messiah.

MICHAEL, ST. [AZORES.]

MICHAEL'S MOUNT. [CORNWALL.]

MICHAELIS, JOHN DAVID, was born at Halle on February 27, 1717. After receiving private instruction, Michaëlis attended the orphan school, and afterwards the university at Halle, where his attention was particularly directed to languages and philosophy. After taking his degree in 1740, he visited England. On his return to Germany he devoted himself to the study of history, oriental languages, and biblical criticism. In 1745 he went to the university of Göttingen at the invitation of Münchausen; and there he spent the rest of his life, although he was invited by Frederic the Great, in 1763, to return to Prussia. To the university of Göttingen Michaëlis rendered the most important services.

In order to throw new light upon biblical science, Michaëlis, in 1756, planned the expedition to Arabia and India, which was conducted by Carsten Niebuhr. In 1775 Michaëlis was made Knight of the Polar Star by the King of Sweden; in 1786 he was appointed an Aulic counsellor of Hanover, and in 1789 he was elected a Fellow of the Royal Society of London. He died August 22, 1791.

The works of Michaëlis are very numerous: the following are some of the most important. I. oriental literature, grammars of Hebrew, Chaldee, Syriac, and Arabic, and treatises on various subjects connected with these languages; 'Orient

and Exegetical Library;' 'Supplementa in Lexica Hebraica.' In philosophy, an essay 'On the Influence of Opinions on Language, and of Language on Opinions.' In history, geography, and chronology, 'Spicilegium Geographiæ Hebræorum exteræ post Bochartum;' 'Mosaisches Recht.' This work was translated into English by Dr. Alexander Smith, in 1814, under the title of 'Commentaries on the Laws of Moses.'

MICHAELIS, JOHN BENJAMIN, was born at Zittau on the last day of the year 1746. At the recommendation of some of his friends he published a volume of poems in 1766. These poems obtained for him the notice of Gellert, Weisse, and Oeser; the last mentioned of whom interested himself warmly in his success, and earnestly recommended him to Gleim, who was afterwards his truest patron, and with whom he lived the greater part of his life. He died on September 30, 1772.

MICHAELMAS, the feast of St. Michael the archangel, September 29. Brady says it was first established in 487.

MICHAUX, ANDRE', was a French botanist. He is chiefly known as the author of a valuable account of the oaks of North America, published in folio, at Paris, in 1801, and of the 'Flora Boreali-Americana,' which appeared in 1803. In the latter work he is said to have been assisted by Professor Louis Claude Richard.

MICHAUX, FRANÇOIS ANDRE', son of André Michaux, was employed by the French government to explore the forests of North America, with a view to the introduction into Europe of the valuable timber-trees of that country. For this purpose he made three voyages to the United States. His principal work is the 'Histoire des Arbres Forestiers de l'Amerique Septentrionale,' Paris, 1810-1818.

MICHEL, MONT ST. [MANCHE, LA.]

MICHELOZZI, MICHELOZZO, was a pupil of Donatello, and was patronised by Cosmo de' Medici. It was for Cosmo that he erected the edifice since denominated the Palazzo Riccardi, at Florence. Michelozzi also greatly improved the court of the Palazzo Vecchio. Among his other works at Florence is the Palazzo Tornabuoni, now Corsi; and in the neighbourhood of that city the villas Cafaggiuolo and Carregi; also a palace at Fiesole, for Giovanni de' Medici, son of Cosmo I. His last work was the monumental chapel of the Annunciation, erected to the memory of Cosmo, in the Chiesa dei Servi, at Florence. Michelozzi died in 1470, aged 68.

MICHIGAN, one of the United States of North America, consists of two distinct portions, the principal of which, or Michigan Proper, is bounded N. by the Straits of Machilimackinac, which connect Lake Michigan and Lake Huron; E. by Lake Huron, St. Clair River, Lake St. Clair, Detroit River, and Lake Erie; W. by Lake Michigan; and S. by Ohio and Indiana. This main portion of the state is 288 miles in length, with an average width of 190 miles, and comprises an area of 38,000 square miles. The other portion of the state lies to the N.W., and is bounded N. by Lake Superior, E. by St. Mary's River, W. by Montreal River, and S. by Lake Michigan, Green Bay, and Menomonee River; it is about 320 miles in length, with a breadth varying from 30 to 160 miles, and comprises an area of about 28,000 square miles. The total area is about 66,000 square miles. The population in 1840 was 212,267, of whom none were slaves.

Surface and Soil.—Michigan Proper, which is chiefly a peninsula between Lake Michigan and Lakes Huron and Erie, is generally level, with few elevations that rise into hills. The ground gradually rises towards the centre of the peninsula, where it forms a sort of table-land about 300 feet above the level of the lakes. A large portion of the soil is fertile, and well adapted for wheat, oats, barley, flax, and pasturage. It contains a great variety of forest trees, and abounds in aquatic fowls, game, and fish. The north-western portion of Michigan is much more elevated than the peninsular part. Mountains and plains, lakes and rivers, extend over it in a great variety of forms. Much of it is covered with forests, and it contains a great variety of minerals. The soils are of great variety, but much of this portion of the state has not yet been explored.

Rivers and Lakes.—As the rivers of the peninsula descend from the table-land to the great lakes, they have a short course. On the table-land they run slowly, but on the declivity their course is accelerated and interrupted by rapids. The most important are St. Joseph's River and Saginaw. St. Joseph's River falls into Lake Michigan, not far from its southern extremity, after a winding course of about 200 miles. Though rather rapid, it is navigable for boats through nearly the whole of its winding course. The Saginaw is formed by a great number of branches, which descend from the table-land lying to the east, south, and west of the depression in which it flows, and which may be considered as a prolongation of Saginaw Bay. Some of these branches flow fifty miles before they unite. After their union, the river takes the name of Saginaw, and is navigable for boats to its mouth, a distance of 25 miles. The rivers St. Clair and Detroit, as well as the lakes of Michigan, Huron, St. Clair, and Erie, are noticed under CANADA. About 40 considerable rivers and a great number of small streams discharge their waters into the three lakes which constitute part of the boundary of the north-western portion of Michigan.

Climate.—The climate of this country is severe. The winter generally begins in the middle of November and lasts to the middle of March. The ice on the rivers and borders of the lakes is strong enough to admit travelling on sledges.

Productions and Trade.—Wheat, maize, and potatoes are grown to a great extent; oats and buckwheat are not so extensively cultivated. Other vegetables thrive very well. The lumber trade and the fisheries furnish the chief sources of employment. The exports in 1840 amounted to 162,229 dollars, and the imports to 138,610 dollars. There are several railroads in progress.

Political Divisions and Towns.—In 1840 there were 32 organised counties, and several other new counties unorganised.

Detroit, a city, and the capital of Michigan, is situated on the western side of the river Detroit, 7 miles below the outlet of Lake St. Clair, in 42° 20′ N. lat., 82° 58′ W. long. The population in 1830 was 2222; in 1845 it was 13,000. The city is regularly laid out, and extends a mile along the river and three-fourths of a mile backwards. It contains a state-house, a city-hall, a theatre, museum, and 11 or 12 churches, some of which are large and handsome. Detroit is well situated for trade, and is becoming a great commercial emporium. The navigation of the river is open about 8 months in the year, during which period large-class steam-vessels ply daily. The Central Railroad, which is intended to extend across the peninsula, has been completed from Detroit to Ann Arbor, 44 miles.

Monroe, a city, is situated on the Raisin, which falls into Lake Erie, 2 miles from the mouth of the river, and 37 miles S.S.W. from Detroit. It contains a court-house, a gaol, and 7 churches. The river affords good water-power, and a canal has been formed betwen the city and Lake Erie, on which steamboats ply daily while the lake is open. A railroad extends 70 miles W. to Hillsdale.

History and Constitution.—Early in the 17th century the French penetrated into this country from Quebec, and in 1670 they founded Detroit. In 1783 Michigan was included in the limits of the United States, but was not given up by the British till 1796. It was constituted a territory in 1805, and was made a state in 1836. The legislature in 1848 consisted of 22 senators, who are elected for two years, and 66 representatives, who are elected for one year. The governor is elected for two years. Michigan sends 2 senators and 3 representatives to Congress.

(*Gazetteer of the United States*, by Haskel and Smith; *American Almanac*, 1849.)

MICHIGAN, LAKE. [CANADA.]

MICIPSA. [JUGURTHA; NUMIDIA.]

MICKLE, WILLIAM*, was born in 1734, at Langholm, in Dumfriesshire. He first attracted attention by an elegiac ode called 'Pollio,' in 1765. This was followed in 1767 by a poem in imitation of Spenser, called 'The Concubine.' He also wrote a 'Letter to Dr. Harwood;' 'Voltaire in the Shades;' and a tragedy entitled the 'Siege of Marseilles.' In 1775 came out his translation of Camoens's 'Lusiad.' This translation procured him much respect among the Portuguese, and he was admitted a member of the Royal Academy of Lisbon. A poem called 'Almada Hill' was a result of his residence at Lisbon. After Mickle's return to London with Governor Johnstone, he wrote several pieces both in prose and verse, the last of which was 'Eskdale Braes,' a ballad. He died at Wheatly, in Oxfordshire, in 1789. A ballad by Mickle, entitled 'Cumnor Hall,' is not without merit; it furnished the idea of Sir W. Scott's 'Kenilworth.'

MICON was the son of Phánochus of Athens. He lived about the middle of the 5th century before Christ.

* Sometimes called William Julius Mickle, but the second name was merely assumed by the author himself.

Micon painted the battle of the Amazons and the Athenians under Theseus, in the gallery of the Ceramícus. In the temple of Theseus he painted another battle of the Amazons and Athenians; and opposite to it the battle of the Centaurs and the Lapithæ. Some other works are also ascribed to him.

It is observable that all Micon's pictures were of such subjects as admit of the introduction of horses, in the painting of which he excelled. Micon was also a sculptor: he executed, according to Pausanias, the statue of Callias. Micon appears to have been not an uncommon name among Greek artists. The father of Onatas of Ægina was Micon; and Pliny mentions Timarete, herself a painter, as the daughter of a painter of the name of Micon. There was also a Syracusan sculptor of the name of Micon.

MICROMETER, is the term generally applied to contrivances for measuring small spaces or angles with great accuracy or convenience; and of these the following are the principal kinds.

Wire Micrometer.—This frequently consists of two fine wires or spider's threads, of which one is fixed and the other moveable, in the eye-tube of a telescope at the place where the image is formed. The moveable wire is in a sliding plate which, by a screw, is moved parallel to the other, and perpendicularly to the axis of the telescope, till the object appears to be comprehended between the wires; and a graduated scale is provided for the measurement of the angle. Each division is equal to the extent of space moved by the wire during one revolution of the screw, and the head of the screw is graduated, in order to subdivide the scale. The value of each division of the scale may be obtained by causing some object subtending a known angle, as the disc of the sun, to occupy the interval between the wires, these appearing to coincide when the index is at the zero point of the scale; then the number of revolutions and the parts of a revolution made by the screw are read on the scale and head of the screw, when by a simple proportion the value of each division is found. The instrument was invented by Mr. Gascoigne in the seventeenth century, but it appears to have been afterwards neglected, and it was re-invented by M. Auzout.

The micrometer microscope, for reading off the divisions of graduated circles, is an instrument of this kind.

The *Position Wire Micrometer* has lately come very much into use for observations of double stars, and is the wire micrometer proper for equatorials. In this construction there are two wires parallel to each other, each moveable by its own screw: the whole apparatus can also be turned round in the plane of the wires, so as to place the wires in any direction, the angle round which it is turned being read off by two verniers upon a small circle called the position circle. In measuring a double star the wires are brought near each other, and the apparatus turned round until the two stars are either threaded on one of the wires, or, being placed between them, are judged to lie in the same direction. The division of the micrometer circle is then read off, and the

observation in position is made. Now, by the divided circle of the micrometer, turn the apparatus round 90°, and the wires will be at right angles to the line joining the two stars. By moving the equatorial, place one wire A on one of the stars, and place the other wire B by its screw on the second star. Read off the screw-head of B, and then place A on the second star by moving the equatorial, and B on the first by moving its screw, and read off the revolutions and parts of B. The difference of the two readings of B will give, in revolutions and parts of the screw, twice the angle between the two stars. (De Morgan's 'Companion to Maps of the Stars,' Appendix.)

2. The *Divided Object-Glass Micrometer* and *Heliometer*. If an object-glass be cut across so as to form two semicircles, and the semilenses be separated by sliding one beyond the other, each portion will form its proper image, and these will retreat from each other as the semilenses are moved. The semilenses are mounted on slides, and the quantity of separation read off upon a scale. In Bessel's heliometer, the most magnificent and most perfect instrument of this class, the focal length of the object-glass is eight French feet, and the aperture nearly six French inches. [HELIOMETER.]

3. The *Divided Eye-Glass Micrometer*. This consists of a convex lens bisected in the direction of a diameter, and placed between the third and fourth lenses in the eye-piece of an achromatic telescope, reckoning from the end to which the eye is applied: it is said to have been invented by Mr. Ramsden, but it appears to have been first made by Mr. Dollond. In instruments of this kind which are made by Mr. Jones, the third eye-glass is divided into two equal segments, which are made to move on the plane of section by means of a screw consisting of two parts, one of which being hollow, and having both exterior and interior threads, the other part turns within it: thus the half lenses move by equal quantities in opposite directions at the same time. The stem of the screw carries a graduated circle, on which, by an index, the movement of the two images of the object is measured.

Mr. Dollond constructed an instrument of a like kind in which the divided lens is that nearest to the eye. (Pearson's 'Practical Astronomy,' vol. ii., sec. 11 and 33.)

Mr. Airy, the astronomer royal, has investigated the distances and focal lengths of the eye-lenses of a telescope, under the condition that (the third lens from the eye being that which is divided) the prismatic dispersion of light arising from the pencil falling on the segments at parts where their surfaces are inclined to the optical axis may be corrected at the same time that the ordinary achromatism is obtained.

4. The *Reticules* and the *Circular Micrometer*. The micrometers hitherto described are applied to the *accurate* measures of small angles; the present class, though very useful in certain cases, are of much lower pretensions. The reticule, or diaphragm, as it is sometimes called, is any fixed arrangement of wires or bars which can be applied to a telescope for the purpose of measurement. Suppose, for example, a cross like an X or V to be cut out of brass plate and inserted in the principal focus of a telescope with the axis of the letter in a meridian. A star, in passing through the field, is occulted at its passage behind each of the bars, and the time noted. The *interval* will show, by an easy calculation, how far it passes from the vertex; and the *mean* of the times, the moment when it passes the axis of the diaphragm. If the true position of any one star so passing is known from any other source, all the other stars can be thus determined differentially with respect to it. This reticule is very convenient for mapping, if placed in the meridian, or for cometary observation, if the telescope is mounted as an equatorial, however rudely.

The Circular Micrometer was introduced, we believe, by Olbers, and perfected by Frauenhofer. A metal ring is set in the centre of a perforated glass plate, and the outer and inner edge of the ring is turned true. The plate is fixed in the focus of a telescope, and the observer notes the time when a star disappears at the outer ring, reappears on the inner ring, disappears again, and finally reappears. If two stars be thus observed, it is clear that when a mean is taken of the disappearances and reappearances of each, that the difference between the two means will be the difference of right ascension between the two stars, and therefore that, if one be known, the other is determined. Again, if the diameter of the ring has been determined, and the declination of the stars nearly known, the time of describing the chord of the ring will give, by an easy computation, the distance of the chord from the centre, and that the more accurately the smaller the chord described. The sum or difference of these two distances is the difference of the stars in declination. Frauenhofer cut a series of rings or lines upon a piece of plane glass which he placed in the principal focus of the object-glass, and then by a side lamp illuminated the rings, leaving the rest of the field dark. For certain observations this micrometer has great advantages.

There are many other micrometers, but they are not in such general use as to demand any notice here. The reader will find them very fully and elaborately described in Pearson's 'Astronomy,' vol. ii., p. 126 to 272 inclusive.

MICRO'PTERUS, the name assigned by Messrs. Quoy and Gaimard to a genus of marine Ducks [FULIGULINÆ], remarkable for the shortness of their wings.

Two species are recorded, both natives of the shores of Patagonia:—1. The Race-Horse of Cook and Byron, the Steamer-Duck of King and Darwin (*Micropterus brachypterus*, Quoy and Gaim.; *Oidemia Patachonica*, King). 2. The Patagonian Steamer-Duck (*Micropterus Patachonicus*, King).

In these ducks the wings are useless except as oars, while the legs are immensely powerful and thick. The neck is short, and the bill stout and deep at the base, but abbreviated. They skim the surface of the ocean with impetuous rapidity, and dive with wonderful address. Shell-fish and crustacea constitute their food.

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(*Proceedings of the Zoological Society*, 1833; *Zool. Journal*, Darwin's *Journal*, &c.)

MI'CROPUS, a genus of the *Meruliдæ*, according to the arrangement of Mr. Swainson, of which the type is the *M. chalcocephalus* (*Ixos chalcocephalus*, Temm.), inhabiting the wooded districts of Bantam.

MICROSCOPE, the name of an instrument for enabling the eye to see distinctly objects which are placed at a very short distance from it, or to see magnified images of small objects, and therefore to see smaller objects than would otherwise be visible. The name is derived from the two Greek words, *μικρὸς*, *small*, *σκοπέω*, to *see*.

The use of the term *magnifying* has led many into a misconception of the nature of the effect produced by convex lenses. It is not always understood that the so-called magnifying power of a lens applied to the eye, as in a microscope, is derived from its enabling the eye to approach more nearly to its object than would otherwise be compatible with distinct vision. The common occurrence of walking across the street to read a bill is in fact magnifying the bill by approach; and the observer, at every step he takes, makes a change in the optical arrangement of his eye, to adapt it to the lessening distance between himself and the object of his inquiry.

In this case the bill would be read with eyes in a very different state of adjustment from that in which it was discovered on the opposite side of the street, but no conviction of this fact would be impressed upon the mind. If however the supposed individual should perceive on some part of the paper a small speck, which he suspects to be a minute insect, and if he should attempt a very close approach of his eye for the purpose of verifying his suspicion, he would presently find that the power of natural adjustment has a limit; for, when his eye has arrived within about ten inches, he will discover that a further approach produces only confusion. But if, as he continues to approach, he were to place before his eye a series of properly arranged convex lenses, he would see the object gradually and distinctly increase in apparent size by the mere continuance of the operation of approaching. Yet the glasses, applied to the eye during the approach from ten inches to one inch, would have done nothing more than had been previously done by the eye itself during the approach from fifty feet to one foot. In both cases the magnifying is effected really by the approach, the lenses merely rendering the latter periods of the approach compatible with distinct vision.

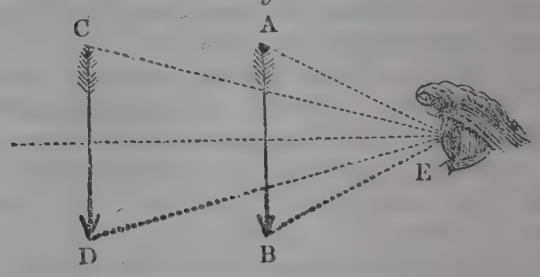
A very striking proof of this statement may be obtained by the following simple and instructive experiment. Take any minute object, a very small insect, for instance, held on a pin or gummed to a slip of glass; then present it to a strong light, and look at it through the finest needle-hole in a blackened card placed about an inch before it. The insect will appear quite distinct, and about ten times larger than its usual size. Then suddenly withdraw the card without disturbing the object, which will instantly become indistinct and nearly invisible. The reason is, that the naked eye cannot see at so small a distance as one inch. But the card with the hole, having enabled the eye to approach within an inch, and to see distinctly at that distance, is thus proved to be as decidedly a magnifying instrument as any lens or combination of lenses.

This description of magnifying power does not apply to such instruments as the solar or gas microscope, by which we look not at the object itself, but at its shadow or picture on a screen; and the description requires some modification as to the compound microscope, where an image or picture is formed by one lens, and that image or picture is viewed as an original object by another lens.

It is so important to obtain a clear notion of the real nature of the effect produced by a lens applied to the eye, that we will adduce the instance of spectacles, to render the point more familiar. If the person who has been supposed to cross the street for the purpose of reading a bill had been aged, the limit to the power of adjustment would have been discovered at a greater distance, and without so severe a test as the supposed insect. The eyes of the very aged generally lose the power of adjustment at a distance of thirty or forty inches instead of ten, and the spectacles worn in consequence are as much magnifying glasses to them as the lenses employed by younger eyes to examine the most minute objects. Spectacles are magnifying glasses to the aged because they enable such persons to see as closely to their objects as the young, and therefore to see the objects larger than they could themselves otherwise see them distinctly, but not larger than they are seen by the unassisted younger eye.

In saying that an object appears larger at one time, or to one person, than another, it is necessary to guard against misconception. By the apparent size of an object we mean the angle it subtends at the eye, or the angle formed by two lines drawn from the centre of the eye to the extremities of the object. In *fig.* 1, the lines A E

Fig. 1.

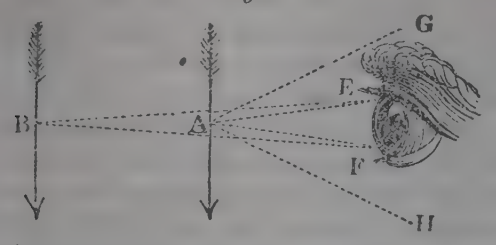


and B E drawn from the arrow to the eye form the angle A E B, which, when the angle is small, is nearly twice as great as the angle C E D formed by lines drawn from a similar arrow at twice the distance. The arrow A B will therefore appear nearly twice as long as C D, being seen under twice the angle, and in the same proportion for any greater or lesser difference in distance. The angle in question is called the angle of vision, or the visual angle.

The angle of vision must however not be confounded with the angle of the pencil of light by which an object is seen, and which is explained in *fig.* 2. Here we have drawn two arrows

placed in relation to the eye as before, and from the centre of each have drawn lines exhibiting the

Fig. 2.

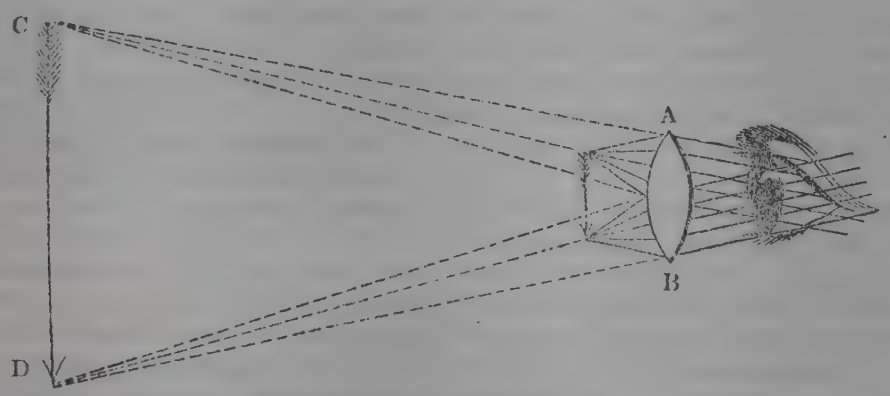


quantity of light which each point will send into the eye at the respective distances.

Now, if E F represent the diameter of the pupil, the angle E A F shows the size of the cone or pencil of light which enters the eye from the point A, and in like manner the angle E B F is that of the pencil emanating from B, and entering the eye. Then, since E A F is double E B F, it is evident that A is seen by four times the quantity of light which could be received from an equally illuminated point at B; so that the nearer body would appear brighter if it did not appear larger; but as its apparent area is increased four times, as well as its light, no difference in this respect is discovered. But if we could find means to send into the eye a larger pencil of light, as for instance that shown by the lines G A H, without increasing the apparent size in the same proportion, it is evident that we should obtain a benefit totally distinct from that of increased magnitude, and one which is in some cases of even more importance than size in developing the structure of what we wish to examine. This is sometimes done.

The magnifying power of a single lens depends upon its focal length, the object being in fact placed nearly in its principal focus, or so that the light which diverges from each point may, after refraction by the lens, proceed in parallel lines to the eye, or as nearly so as is requisite for distinct vision. In *fig.* 3, A B is a double convex lens, near which is a small arrow to represent the object

Fig. 3.



under examination, and the cones drawn from its extremities are portions of the rays of light diverging from those points and falling upon the lens. These rays, if suffered to fall at once upon the pupil, would be too divergent to permit their being brought to a focus upon the retina by the optical arrangements of the eye. But, being first passed through the lens, they are bent into nearly parallel lines, or into lines diverging from some points within the limits of distinct vision, as from C and D. Thus altered, the eye receives them precisely as if they emanated from a larger arrow placed at C D, which we may suppose to be ten inches from the eye, and then the difference between the real and the imaginary arrow is called the magnifying power of the lens in question.

From what has been said, it will be evident that two persons, whose eyes differed as to the distance at which they obtained distinct vision, would give different results as to the magnifying power of a lens. To one who can see distinctly with the naked eye at a distance of five inches, the magnifying power would seem and would indeed be only half what we have assumed. Such instances are however rare; the focal length of the eye usually ranges from six to twelve or fourteen inches, so that the distance we first assumed of ten inches is very near the true average, and is a convenient number, inasmuch as a cipher added to the denominator of the fraction which expresses the focal length of a lens gives its magnifying power. Thus a lens whose focal length is one-sixteenth of an inch is said to magnify 160 times.

We have hitherto considered a magnifying lens only in reference to its enlargement of the object, or the increase of the angle under which the object is seen. A further and equally important consideration is that of the number of rays or quantity of light by which every point of the object is rendered visible. The naked eye, as shown in *fig.* 2, admits from each point of every visible object a cone of light having the diameter of the pupil for its base; and most persons are familiar with that beautiful provision by which in cases of excessive brilliancy the pupil spontaneously contracts to reduce the cone of admitted light within bearable limits. This effect is still further produced in the experiment already described, of looking at an object through a needle-hole in a card, which is equivalent to reducing the pupil to the size of a needle-hole. Seen in this way, the object becomes comparatively dark or obscure, because each point is seen by means of a very small cone of light; and a little consideration will suffice to explain the different effects produced by the needle-hole and the lens. Both change the angular value of the cone of light presented to the eye, but the lens changes the angle by bending the extreme rays within the limits suited to distinct vision, while the needle-hole effects the same purpose by cutting off the rays which exceed those limits.

It has been shown that removing a brilliant object to a greater distance will reduce the quantity of light which each point sends into the eye as effectually as viewing it through a needle-hole; and magnifying an object by a lens has been shown to be the same thing in some respects as removing it to a greater distance. We have to see the magnified picture by the light emanating from the small object, and it becomes a matter of difficulty to obtain from each point a sufficient quantity of light to bear the diffusion of a great magnifying power. We want to perform an operation just the reverse of applying the card with the needle-hole to the eye—we want in some cases to bring into the eye the largest possible pencil of light from each point of the object.

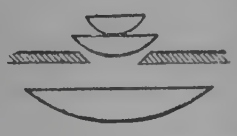
Referring to *fig.* 3, it will be observed that, if the eye could see the small arrow at the distance there shown without the intervention of the lens, only a very small portion of the cones of light drawn from its extremities would enter the pupil; whereas we have supposed that after being bent by the lens the whole of this light enters the eye as part of the cones of the smaller angle whose summits are at C and D. These cones will further explain the difference between large and small pencils of light; those from the small arrow are large pencils; the dotted cones from the large arrow are small pencils.

In assuming that the whole of this light could have been suffered to enter the eye through the lens A B, we did so for the sake of not perplexing the reader. He must now learn that so large a pencil of light passing through a single lens would be so distorted by the spherical figure of the lens, and by the chromatic dispersion of the glass, as to produce a very confused and imperfect image. This confusion may be greatly diminished by reducing the pencil; for instance, by applying a stop, as it is called, to the lens, which is neither more nor less than the needle-hole applied to the eye. A small pencil of light may be thus transmitted through a single lens, without suffering from spherical aberration or chromatic dispersion any amount of distortion which will materially affect the figure of the object; but this quantity of light is insufficient to bear diffusion over the magnified picture, which is therefore too obscure to exhibit what we most desire to see,—those beautiful and delicate markings by which one kind of organic matter is distinguished from another. With a small aperture these markings are not seen at all; with a large aperture and a single lens they exhibit a faint nebulous appearance enveloped in a chromatic mist, a state which is of course utterly valueless to the naturalist, and not even amusing to the amateur.

It becomes therefore a most important problem to reconcile a large aperture with distinctness, or, as it is called, *definition;* and this has been done in a considerable degree by effecting the required amount of refraction through two or more lenses instead of one, thus reducing the angles of incidence and refraction, and producing other effects which will be shortly noticed. This was first accomplished in a satisfactory manner by Dr. Wollaston's Doublet, invented by the celebrated philosopher whose name it bears; it consists of two plano-convex lenses having their focal lengths in the proportion of 1 to 3, or nearly so, and placed at a distance which can be ascertained best by actual experiment. Their plane sides are placed towards the object, and the lens of shortest focal length next the object. This doublet however requires a nice adjustment of the stop in order to render it of any value.

The next step in the improvement of the simple microscope was made by Mr. Holland, and it consists (as shown in *fig.* 4) in substituting two lenses for the first in the doublet, and retaining the stop between them and the third. The first bending, being thus effected by two lenses instead of one, is accompanied by smaller aberrations, which are therefore more completely balanced or corrected at the second bending, in the opposite direction, by the third lens. This combination, though called a triplet, is essentially a doublet, in which the anterior lens is divided into two. For it must be recollected that the first pair of lenses merely accomplish what might have been done, though with less precision, by one; but the two lenses of the doublet are opposed to each other; the second diminishing the magnifying power of the first. The first pair of lenses in the triplet concur in producing a certain amount of magnifying power, which is diminished in quantity and corrected as to aberration at the third lens by the change in relation to the position of the axis which takes place in the pencil between what is virtually the first and second lens. In this combination the errors are still further reduced by the close approximation to the object, which causes the refractions to take place near the axis. Thus the transmission of a still larger angular pencil, namely 65°, is rendered compatible with distinctness, and a more intense image is presented to the eye.

Fig. 4.



Every increase in the number of lenses is attended with one drawback, from the circumstance that a certain portion of light is lost by reflection and absorption each time that the ray enters a new medium. This loss bears no sensible proportion to the gain arising from the increased aperture, which, being as the square of the diameter, multiplies rapidly; or, if we estimate by the angle of the admitted pencil, which is more easily ascertained, the intensity will be as the square of twice the tangent of half the angle.

The combination of three lenses approaches, as has been stated, very close to the object; so close indeed as to prevent the use of more than three; and this constitutes a limit to the improvement of the simple microscope, for it is called a simple microscope, although consisting of three lenses, and although a compound microscope may be made of only three, or even two lenses.

A very useful form of lens was proposed by Dr. Wollaston, and called by him the Periscopic Lens. It consisted of two hemispherical lenses, cemented together by their plane faces, having a stop between them to limit the aperture. A

similar proposal was made by Mr. Coddington, who however executed the project in a better manner, by cutting a groove in a whole sphere, and filling the groove with opaque matter. This is the well-known Coddington Lens.

Various, indeed innumerable, other forms and combinations of lenses have been projected, some displaying ingenuity, but few of practical use.

It was at one time hoped, as the precious stones are more refractive than glass, and as the increased refractive power is unaccompanied by a correspondent increase in chromatic dispersion, that they would furnish valuable materials for lenses, inasmuch as the refractions would be accomplished by shallower curves, and consequently with diminished spherical aberration. But these hopes were disappointed. The great reflective power, the doubly-refracting property, the colour, and the heterogeneous structure of the jewels which were tried, much more than counterbalanced the benefits arising from their greater refractive power, and left no doubt of the superiority of skilfully made glass doublets and triplets.

By the term *Simple Microscope* is meant one in which the object is viewed directly through a lens or combination of lenses, just as we have supposed an arrow or an insect to be viewed through a glass held in the hand. When however the magnifying power of the glass is considerable, in other words, when its focal length is very short, and its proper distance from its object of consequence equally short, it requires to be placed at that proper distance with great precision: it cannot therefore be held with sufficient accuracy and steadiness by the unassisted hand, but must be mounted in a frame having a rack or screw to move it towards or from another frame or stage which holds the object. It is then called a microscope, and it is furnished, according to circumstances, with lenses and mirrors to collect and reflect the light upon the object, and with other conveniences.

The *Compound Microscope* may consist of only two lenses, while a simple microscope has been shown to contain sometimes three. In the triplet for the simple microscope, however, it was explained that the effect of the two first lenses was to do what might have been accomplished, though not so well, by one; and the third merely effected certain modifications in the light before it entered the eye. But in the compound microscope the two lenses have totally different functions; the first receives the rays from the object, and, bringing them to new foci, forms an image, which the second lens treats as an original object, and magnifies it just as the single microscope magnified the object itself.

By a pre-arrangement of the relative proportions in which the magnifying power shall be divided between the object-glass and the eye-glass, almost any given distance (within certain limits) between the first and its object may be secured. This is one valuable peculiarity of the compound instrument; and another is the large field, or large angle of view, which may be obtained, every part of which will be nearly equally good; whereas with the best simple microscopes the field is small, and is good only in the centre. The field of the compound instrument is further increased by using two glasses at the eye-end; the first being called, from its purpose, the Field-Glass, and the two constituting what is called the Eye-Piece.

For upwards of a century the compound microscope, notwithstanding the advantages above mentioned, was a comparatively feeble and inefficient instrument, owing to the distance which the light had to traverse, and the consequent increase of the chromatic and spherical aberrations. But the construction of achromatic object-glasses, by means of which the light comes uncoloured to the eye, has engaged the attention of some of the greatest philosophers of modern times, and so great have been the improvements made within the last twenty years, that the Compound Microscope now holds a very high rank among philosophical implements, while the transcendant beauties of form, colour, and organization which it reveals to us in the minute works of nature, render it subservient to the most delightful and instructive pursuits.

The *Solar Microscope* consists of a conical tube fixed by its base to a frame of wood, which is screwed to a closed window-shutter, at an aperture purposely made in the shutter: the tube projects into the room, which, when the observations are to be made, is rendered quite dark, and is sometimes lined with black cloth. The magnifying power is produced by a system of lenses contained in the tube, as in other microscopes. On the exterior of the window is a frame carrying a rectangular piece of looking-glass, which, by turning on a hinge, is capable of being fixed at any angle with the wall of the building, while, by means of a ring and a rack and pinion, it can be made to turn on the horizontal axis of the instrument, so as to permit the rays of the sun, whatever be the position of the latter, to be reflected into the tube. These rays are made to converge on the object; and from thence, after refraction through the system of object-glasses, they proceed to a screen on which they depict the magnified image. When the object is transparent, the rays of solar light are allowed to pass from the mirror directly through the lenses to the screen; but, when it is opaque, a convex lens placed at the aperture in the window-shutter causes the solar rays to be condensed on a small mirror placed in a box at that end of the instrument which is within the room, and from this mirror the rays are reflected to the object. The condensed light thus thrown on the object diverges from thence, and passes by refraction through the system of lenses in which the magnifying power is produced—these lenses being placed in a tube which, as well as the object, is within the box containing the mirror last mentioned, but a little above the latter, so that the rays of light proceeding from the object to the magnifying lenses may not be intercepted.

The solar microscope is now nearly superseded by the *Oxyhydrogen Microscope.* [LUCERNAL MICROSCOPE.]

MICROSCOPIUM (the Microscope), a constellation of Lacaille, situated above Grus and Indus at the junction of Capricornus and Sagittarius.

MICROZOA'RIA (literally animalcules, or minute animals), a title adopted by M. de Blainville for the *Animalcula Infusoria* of the earlier writers, who commonly classed these singular objects of microscopic research among the zoophyta.

There is not a drop of water in the sea, in lakes, in ditches, or in rivers, which does not teem with a living multitude of microscopic animals. The forms are very various, and the established genera very numerous.

MIDAS (Zoology), M. Geoffroy's name for a genus of South American monkeys, called Ouistites, Squirrel-Monkeys, or Marmosets, &c. [JACCHUS.] Example, The Marikina, or Silky Tamarin (*Midas Rosalia*). Locality, Guiana and South Brazil.

MIDDLE LATITUDE (Navigation), the mean of two latitudes. It is the distinctive name of a method called in Navigation Middle Latitude Sailing, which means that, in estimating the difference of longitude by means of the differences of latitude and the intermediate departure, this departure is supposed to be an arc of a parallel of longitude at the intermediate or middle latitude. (Riddle's *Navigation*, in which a table may be found corrective of the results.)

MIDDLE VOICE is a term employed in Greek grammar to indicate a class of verbs which are called reflective in some other languages. The reflective meaning is supposed to be the original signification of the middle voice, but it is difficult in many of the middle verbs in Greek to trace the reflective notion. Although a distinct mode of conjugation has been assigned to verbs with a middle signification, there are only two tenses in the Greek verb which have a form peculiar to the middle notion, namely, the first and second aorists in *σαμην* and *ομην*; which, in the model verb, are *ἐτυψάμην* and *ἐτυπόμην*. The future in *σομαι* (*τύπ-σομαι*, *λέγ-σομαι*), which is called in most grammars the future middle, has a passive signification as well as a middle.

There are two voices in the Sanskrit, answering to the Greek active and middle, which are called respectively *parasmaipadum* and *atmanêpadum*; the former answering to the active in Greek, and the latter having generally a reflective or medial, but never a passive signification.

MIDDLESEX, the metropolitan county of England, is bounded N. by Hertfordshire, E. by Essex, S.E. by Kent, S. by Surrey, and S.W. by Buckinghamshire. Its greatest length N.E. to S.W. is 28 miles; its greatest breadth, at right angles to the length, is 17 miles. The area is 282 square miles. The population in 1841 was 1,576,636.

Surface; Geological Character.—The surface of the county consists for the most part of gentle undulations, affording a sufficient slope for the purposes of drainage. A range of hills extends along the Hertfordshire border, averaging 400 feet in height above the level of the Thames. Another range of hills skirts the northern side of the metropolis by Highgate and Hampstead. Harrow occupies an insulated eminence between these two ranges. That portion of the county which lies south-west of a line drawn from Brentford to Uxbridge is an almost unbroken flat, scarcely rising more than from 10 to 20 feet above the level of the Thames.

The county is chiefly occupied by the London clay. In parts of the northern and western boundary the plastic clay crops out. The high ground about Hampstead, Highgate, and Hornsey consists of Bagshot Sand, a marine formation of unascertained depth covering the London clay. The thickness of the London clay varies from about 40 feet to 250 feet.

The county belongs entirely to the basin of the Thames, which forms its southern boundary. [THAMES.] The Lea forms the eastern boundary of the county, which it touches below Waltham Abbey, whence it flows S. and S.E. 14 miles to its junction with the Thames. At Waltham Abbey and at Lea Bridge the river is divided into channels, and there are some navigable cuts connected with it. There are several mills on those channels of the Lea which are not used for navigation. The Colne forms the western boundary of the county. It first touches the border below Rickmansworth, and its waters, like those of the Lea, frequently flow in several channels. It flows S. about 18 miles to its junction with the Thames above Staines. It is not navigable, but is useful in turning a number of mills. The Brent rises just within the northern border of the county, and, after crossing a corner of Hertfordshire, flows by a very circuitous course into the Thames. It is not navigable, except in some part of its lower course, where it forms part of the line of the Grand Junction Canal. The Cran rises between Harrow and Pinner, and, after a very circuitous course of 19 or 20 miles, joins the Thames at Isleworth.

The principal canal is the Grand Junction, which enters the county near Harefield, in the N.W. corner, and, after a course of about 18 miles, joins the Thames near Brentford. A branch from this canal near Cranford runs N.E. to Northolt, and thence S.S.E. to Paddington, a distance of 12 or 14 miles. The Regent's Canal commences in the Paddington branch of the Grand Junction Canal, and passes along the north and east sides of the metropolis to the Thames near Limehouse. Its length is 8½ miles. It passes under Islington and the New River by a tunnel.

The New River, an artificial cut which supplies a large portion of the metropolis with water, enters the county on the north side between Enfield and Cheshunt, and is conveyed in a very winding channel to a reservoir near Pentonville, on the north side of London. All the railways which communicate with the metropolis on the north side of the Thames pass through various parts of Middlesex.

Divisions and Towns.—Middlesex is divided into 6 hundreds. It is in the diocese of London, and is divided between the archdeacons of London and Middlesex.

The county is, in civil suits, within the immediate jurisdiction of the superior courts sitting

in the metropolis. In criminal cases of the more important class it is within the jurisdiction of the Central Criminal Court, held in the Old Bailey in London. Middlesex returns 2 members to parliament for the county, 4 for the city of London, 2 for the city of Westminster, and 2 each for the metropolitan boroughs of Marylebone, Finsbury, and the Tower Hamlets: total 14 members.

The following are the principal towns, with the population of each in 1841:—

Bow, a suburb of London, is 2½ miles E. from Whitechapel church. The river Lea is here crossed by an ancient bridge. Population of the parish, 4626.

Brentford, a market town, is situated on the north bank of the Thames, about 8 miles W. by S. from the General Post-Office. The trade of the town is derived chiefly from the thoroughfare. Population of the chapelry, 5058.

Bromley is adjacent to Bow. Distilling and calico printing are carried on, and many of the inhabitants are engaged in the East and West India Docks, and in the adjacent dockyards in Limehouse and Stepney. Population of the parish, 6154.

Chelsea, a suburb united to London on the west, is situated on the bank of the Thames. The Royal Hospital for invalid soldiers is at Chelsea. The foundation stone was laid on May 8, 1609. The Royal Military Asylum, founded in 1801, is also in Chelsea. Population of the parish, 40,179.

Edgware is a village 8 miles N.N.W. from Tyburn turnpike, on the Edgeware Road. Population of the parish, 659.

Edmonton is on the York road, 7 miles N. from Shoreditch church, between Tottenham and Enfield. The village of Edmonton consists of two principal groups, called Upper Edmonton and Lower Edmonton. Population of the parish, 9027.

Enfield is 9½ miles N. from Shoreditch Church, on the York road. The Lea navigation and the New River pass through this parish, which has a population of 9367.

Fulham is 4 miles W.S.W. from Hyde-park Corner, on the north bank of the Thames. The Thames is here crossed by a wooden bridge. There are extensive market-gardens in the parish, which contains a population of 9319.

Hackney is a suburb of London on the north, 2 miles from Shoreditch church. Population of the parish, including the hamlets of Shacklewell, Kingsland, Dalston, and Beauvoir Town, 37,771.

Hammersmith is 4 miles W. by S. from Hyde-park Corner. The principal street extends nearly 2 miles along the western road. Population of the parish, 13,458. An elegant suspension-bridge crosses the Thames at this place.

Hampstead is on high ground, 4 miles N. from Holborn Bars. The parish includes the village of Hampstead and the hamlet of Kilburn. Population, 10,093.

Hampton is about 15 miles W.S.W. from Hyde-park Corner. The parish, including the hamlet of Hampton Wick, has a population of 4711. In this parish is the royal palace of Hampton Court. The great eastern and southern fronts are the most modern parts of the building, and these portions were erected by Sir Christopher Wren. The palace contains a large number of pictures by the old masters, as well as the Cartoons of Raffaelle. It is open to the public gratis every day except Friday. A branch from the South-Western Railway now extends to Hampton Court Bridge.

Harrow-on-the-Hill is a village, 10 miles N.W. from Tyburn turnpike. The village is irregularly laid out. It derives its celebrity and chief support from its grammar-school, which was founded by John Lyon, a wealthy yeoman of this parish, A.D. 1571. The scholars are chiefly the sons of the nobility and gentry. Population of the parish, 4627.

Highgate is on high ground on the great north road, 4 miles from London. Part of the village is in the parish of St. Pancras, and part in Hornsey parish. Population of the chapelry, 4302.

Hornsey is about 5 miles N. from London. Population of the parish, 2919.

Hounslow is 10 miles W. by S. from Hyde-park Corner, and consists of a long street on the Exeter road. Population of the chapelry, 3097. Adjoining to the town, on the west, was formerly an extensive heath, notorious for highway robberies. There are large cavalry barracks and an exercise-ground on what was formerly the heath.

Isleworth, adjoining Twickenham on the north side, is 8½ miles from Hyde-park Corner. Population of the parish, 4903.

Islington is a suburb immediately joining London on the north. Population of the parish, 55,690.

Kensington is a suburb immediately joining London on the west. Population of the parish, 17,319. There is at Kensington a royal palace, built on the site of a residence belonging to the family of Finch, earls of Winchelsea and Nottingham, from whom it was purchased by William III. The palace is situated in the beautiful inclosed grounds called Kensington Gardens, which adjoin Hyde Park on the west.

London is the metropolis of Great Britain. [LONDON.]

Staines is 16½ miles W. by S. from Hyde-park Corner. The principal street extends half a mile along the road, and leads to the Thames. A stone bridge here crosses the river. Population of the parish, 2487.

Stepney and *Limehouse* are suburbs immediately adjacent to London on the east side. The parish of Stepney comprehends the hamlets of Mile-End Old Town, Mile-End New Town, and part of Ratcliff. Population of the parish of Stepney, 63,723. Population of Limehouse parish, including part of the hamlet of Ratcliff, 21,121. These parishes contain the East India Docks and the West India Docks, and the basin at the junction of the Regent's Canal with the Thames.

Tottenham is 4 miles N. from Shoreditch church, on the York road. The parish of Tottenham is divided into the four wards of Tottenham High Cross (population, 2222), Lower Cross Ward (pop. 2137), Middle Ward (pop. 2874), and Wood

Green (pop. 1351). There are extensive flour and oil mills on the Lea river, near Tottenham.

Twickenham is on the west bank of the Thames, 10 miles from Hyde-park Corner. Population of the parish, 5208.

Uxbridge is 15 miles W. by N. from Tyburn turnpike. The town stands on the eastern side of a branch of the river Colne, and consists of one principal street, about a mile in length, along the Oxford road, and two or three smaller ones. There are in the principal street two bridges over the arms of the river Colne, and one over the Grand Junction Canal. There is a commodious market-house. The corn-market is held on Thursday, and is very large. Population of the chapelry, 3219.

History.—In the earliest period of history this part of the island was comprehended in the domains of the Trinobantes, who occupied Essex. It was probably traversed by Cæsar in his second expedition into Britain (B.C. 54), after he had crossed the Thames. It fell under the Roman dominion in the time of Claudius, but was overrun by the Britons in the general revolt under Boadicea. [BOADICEA.]

In the Saxon division of the island this county is generally considered to have been a part of the kingdom of the East Saxons. The Saxon states were divided into seven kingdoms, which were distinct from each other, though the weaker were commonly held in subjection by their more powerful neighbours. Of these petty states Middlesex (the territory of the Middle Saxons) seems to have been uniformly a portion of the East Saxon kingdom.

In the wars which the Saxon princes sustained with the Danes, London was repeatedly taken by that people; and the subsequent history of Middlesex has nothing of much importance distinct from the history of the metropolis. [LONDON.]

MIDDLETON. [CORK.]

MIDDLETON, THOMAS, a dramatist in the reigns of Elizabeth, James I., and Charles I. He was born about 1570; buried July 4, 1627, in the parish church of Newington Butts. His own plays are numerous, and he assisted Jonson, Massinger, and Rowley in the composition of several of their pieces. 'A Mad World, my Masters,' the 'Mayor of Queenborough,' and 'The Roaring Girl,' are in Dodsley's Collection. There is an edition of Middleton's works by the Rev. A. Dyce, 5 vols. cr. 8vo., 1840, with some account of the author.

MIDDLETON, SIR HUGH, was the sixth son of Richard Middleton, Esq., governor of Denbigh Castle during the reigns of Edward VI., Mary, and Elizabeth. The date of Hugh Middleton's birth is unknown, and nothing has been recorded of his life previous to his great undertaking of forming the New River and bringing it to London, except that he was a goldsmith in London, and had realised a very large property by the working of some copper-mines in Wales. In 1606 he offered to bring a sufficient supply of water to London at his own cost. He fixed on the Chadwell and Amwell springs, near Ware, in Hertfordshire as the sources out of which his New River was to be formed; and on April 20, 1608, he commenced his work. The distance from London by the road is about twenty miles, but the whole course of the river is thirty-seven miles. The difficulties and opposition of various kinds which he had to contend with, rendered it impossible to complete the work in the stipulated four years, and Middleton was granted an extension of time. Soon afterwards however he found that his large property was entirely exhausted. He applied in vain to his fellow-citizens for assistance. He then solicited the king, James I., who, May 2, 1612, entered into a covenant with Middleton, by which he engaged to pay half the expense, past and future, on condition of being entitled to half the property. The work was now pushed forward with increased vigour, and on Sept. 29, 1613, five years and five months from the commencement of the undertaking, the stream was admitted into the reservoir prepared for it at Sadler's Wells, near Pentonville. The whole expense of the work was about 500,000*l.* Middleton was knighted soon afterwards, but for eighteen years after the completion of his undertaking no dividend was returned, and in the nineteenth year the first dividend only amounted to 11*l.* 19*s.* 1*d.* on each share.

Sir Hugh Middleton was compelled to sell his shares, and to support himself by the profession of what is now called a civil engineer. On October 19, 1622, he was created a baronet, and the usual fine was remitted.

In 1636 Charles I. re-granted to Sir Hugh the whole of King James's shares, for an annual rent of 500*l.* Middleton is supposed to have died soon afterwards, leaving a family in very indifferent circumstances.

MIDDLETON, CONYERS, was born in 1683, and was the son of William Middleton, rector of Hinderwell, near Whitby, in Yorkshire. In 1706 he was elected a fellow of Trinity College, Cambridge. When George I. visited the university in 1717, Middleton, with several others, was created Doctor of Divinity; but Bentley, who was Regius Professor of Divinity, refused to confer the degree unless a fee of four guineas was given to him in addition to the broad piece which was the customary compliment on this occasion. Middleton paid the money and sued Bentley for it in the vice-chancellor's court; and Bentley, refusing to acknowledge the jurisdiction of the court, was deprived of all his degrees by a grace of the senate, October 17, 1718. [BENTLEY.] Middleton, to justify himself and his friends, published three or four pamphlets, chiefly directed against Bentley, who brought an action against Middleton for an alleged libel contained in one of them, and obtained a verdict.

Middleton was afterwards elected to an office which was created specially for him by friends in the university, that of principal librarian; and he published a plan for arranging the university library, which was entitled 'Bibliothecæ Cantabrigiensis Ordinandæ Methodus quædam,' 1723.

Having lost his wife shortly after this, he travelled on the Continent, and spent some months in Rome in 1724. On his return to

England, he renewed his suit against Bentley for the recovery of the four guineas, who at length repaid the money to Middleton in 1725. In 1729 Middleton published his celebrated 'Letter from Rome,' in which he attempted to show that 'the religion of the present Romans was derived from that of their heathen ancestors.' This, and several publications which followed, gave great offence to many divines of his own communion, and caused him to be looked upon as a disbeliever in the fundamental doctrines of Christianity.

While these discussions were going on, Middleton was appointed to the professorship of natural history, which had been recently founded by Dr. Woodward, which appointment he resigned in 1734, and soon after married again. In 1741 he published by subscription his most celebrated work, 'The History of the Life of M. Tullius Cicero,' Lond., 2 vols. 4to. There were 3000 subscribers to this work, and the profits arising from its sale were so considerable as to enable Middleton to purchase a small estate at Hildersham, 6 miles from Cambridge, where he chiefly resided during the remainder of his life.

Among the most remarkable of his subsequent works, was his 'Free Inquiry into the Miraculous Powers,' &c. This work gave even more offence than his previous works, and was generally condemned by the clergy.

Middleton died at Hildersham on July 28, 1750. His works, with the exception of his 'Life of Cicero,' were collected and published after his death in 4 vols. 4to., 1752, and subsequently in 5 vols. 8vo.

MIDDLETON, THOMAS FANSHAW, D.D., the first English Bishop of Calcutta, was the only son of the Rev. Thomas Middleton, rector of Redleston, in Derbyshire, and was born at that village, Jan. 26, 1769. In 1779 he was admitted into Christ's Hospital, London, and took his degree of B.A., with honours, at Pembroke Hall, Cambridge, in Jan. 1792.

He enjoyed several preferments in England before he was appointed to the Bishopric of Calcutta, in 1814. While in India, he made every effort to promote the interests of Christianity, and to aid the cause of education. By his efforts the Bishop's College at Calcutta was established for the education of clergymen and missionaries for the British possessions in Asia. He also instituted a consistory court at Calcutta.

Bishop Middleton died of a fever on July 8, 1822. As all his papers were destroyed by a direction in his will, none of his works have appeared except the 'Doctrine of the Greek Article,' and some sermons, charges, and tracts, which have been collected into a volume, to which a memoir of Bishop Middleton is prefixed, by H. K. Bonney, D.D., archdeacon of Bedford (Lond., 1824).

MIDDLEWICH. [CHESHIRE.]

MIDIANITES, the descendants of Midian, the son of Abraham by Keturah (Gen. xxv. 2, 4), who, with the other sons of Abraham's concubines, migrated eastward from Canaan during Abraham's life (Gen. xxv. 6). Their subsequent history may be traced in various portions of the Scriptures. The exact country of the Midianites is not determined with certainty. The more common opinion is, that their possessions extended from Mount Sinai and the head of the Red Sea up towards the plains of Moab.

MIDLOTHIAN. [EDINBURGHSHIRE.]

MIDRIFF. [DIAPHRAGM.]

MIDSHIPMEN are young men ranking as the highest of the first class of petty officers on board a ship of war: their duty is to pass to the seamen the orders of the captain or other superior officer, and to superintend the performance of the duties so commanded. They are educated for their profession at the Royal Naval College, and are required to complete two years' service at sea before they can be rated.

By the regulations of 1833, the whole number allowed to be entered on board a ship of war varies according to the rate of the latter; a sixth-rate ship may have eight midshipmen, and a first-rate may have twenty-four. On a ship being put in commission, the captain or commander may select the midshipmen from the Royal Naval College, subject however to the approbation of the Lords of the Admiralty.

The monthly pay of an officer of this class is 2*l.* 8*s.* for ships of all rates.

MIDSUMMER EVE. On the eve of the feast of the Nativity of St. John the Baptist, or Midsummer Day, it was long the custom to kindle fires at midnight, sometimes upon the hills, in honour of the summer solstice; a practice which Gebelin, in his 'Allegories Orientales,' says was followed among the ancient nations. In later times these were sometimes called St. John's Fires.

MIEL, JAN (properly *Meel*, and sometimes named *Giovanni dello Vite*), one of the most eminent of the Flemish artists, was born in 1599. He studied under Gerard Segers, and afterwards went to Rome. His favourite subjects were holiday parties, carnivals, gipsies, beggars, and pastoral scenes and persons. He likewise painted historical pictures on a large scale, both in fresco and oil. He became principal painter to Charles Emanuel, duke of Savoy. There are many capital pictures by this artist in the Imperial Gallery at Vienna; and in a grand saloon in the hunting seat at Turin there is a series of his noblest productions, representing the chase of various kinds of animals. He died in 1664.

MIEREVELT, MICHIEL JANZEN, was born at Delft in 1568. He studied under Antony Bloklandt at Utrecht.

Mierevelt painted almost exclusively portraits, which, though extremely numerous—Houbraken computes them at 5,000—are generally well drawn and very elaborately finished. Many of them are engraved by various masters, and there are a few etchings by his own hand. He died at Delft, in 1641, and left two sons, who were excellent portrait painters, Pieter Mierevelt and Jan Mierevelt; the elder was born in 1595, and died in 1623: the younger also died young.

MIERIS, FRANCIS (the Elder), was born at Leyden in 1635. He was first placed under the care of Abraham Toorne Vliet, and afterwards

became a pupil of Gerard Douw. He excelled Douw in elegance, in correctness and brilliancy of colouring, and in the art of painting silk, velvet, satin, and other rich stuffs, and was nearly equal to him in finish. His finest portrait is that of the wife of M. Cornelius Plaats. Some of his pictures are in the Florence Gallery. He died in 1681.

MIERIS, WILLIAM (the Younger), the son and disciple of Francis, was born at Leyden, in 1662. He was inferior to his father in design, grouping, and effect; nor has he the same exquisite touch. He died in 1747.

MIERIS, FRANCIS (called the Young Francis), was the son of William, and also a painter; but he is more distinguished as an historian, by his 'Historie der Nederlandsche Vorsten,' 3 vols. fol., the Hague, 1732-5; and 'Groot Charterboek der Graven van Holland, Zeeland, en Vriesland,' 4 vols., Leipzig, 1753-6. He died in 1763.

MIGLIARA, GIOVANNI, was born at Alessandria in Piedmont, Oct. 15, 1785, of poor parents, who placed him with Luigi Zuccoli of Milan, to learn wood engraving; but Zuccoli sent him to study architecture and perspective, under Albertolli and Levati, at the academy of the Brera. He next studied scene-painting under Galiari, and practised that branch of art about eight years, 1802-10. This successful career was arrested by a long and dangerous pulmonary attack, which reduced him to pecuniary distresses. He now relinquished painting for the stage, and employed himself in making pictures on a small scale of various scenes—theatrical, architectural, and illustrative of manners, or of some historical incident. These subjects found eager purchasers. Such was the reputation he acquired, that not only the King of Sardinia bestowed upon him the Order of Merit, but his native town Alessandria struck a medal in honour of him in 1829. He died, after a short return of his former pulmonary complaint, April 18, 1837.

MIGNARD, PETER (called the Roman), was born at Troyes in 1610. His father was of English origin, and his proper name was More. The son spent 22 years at Rome, during which time he painted many historical pictures and portraits, among which those of popes Urban VIII. and Alexander VII. were the finest. In 1658 he was invited to Paris, and acquired the favour of Louis XIV., who gave him a patent of nobility; and, after the death of Le Brun, appointed him principal painter and director of the Gobelin manufactory. Mignard executed in fresco the cupola of Val de Grace. He also adorned the great hall at St. Cloud with mythological subjects, undertook several works at Versailles, and painted numerous portraits. He died in 1695.

Nicholas Mignard, Peter's brother, two years older, was a very respectable artist. He died at Paris in 1668, where he was director of the Royal Academy of Painting.

MIHIEL, ST. [MEUSE.]

MIKA'NIA, a genus of plants belonging to the natural order *Compositæ*. *M. officinalis* is a native of Brazil. It is a handsome plant. The leaves contain a bitter principle and an aromatic oil, and are used in the same way and for the same diseases as the Cascarilla and Cinchona barks. *M. Guaco*, Guaco Plant, is one of the plants called *Guaco* in South America, and is used both internally and externally as a remedy against the bites of poisonous serpents. It is easily known from other plants by the large indigo blue spots that mark the under surface of its rough leaves. *M. opifera* is a smooth climbing plant, a native of Brazil. It is also employed against the bites of snakes, and is said to effect a cure by its powerful diuretic action. The genus *Mikania* is closely allied to *Eupatorium*, and they belong to a group of plants in the order *Compositæ*, the most remarkable for their activity.

MILA'NO, THE PROVINCE OF, is bounded on the N. by Como, on the E. by Bergamo, on the S. by Lodi and Pavia, and on the W. by the Sardinian territory. The province of Milan is entirely in the great plain of Lombardy, and is watered by the Lambro, the Olona, and other affluents of the Po. Numerous canals communicate with these various rivers. The soil is in most parts fertile, and the country is well cultivated, full of large villages, farm-houses, and country-houses. The chief products are corn, rice, fruit, grass for cattle, and silk. The population is about 540,000. The province is divided into fifteen districts: Milano, Bellate, Saronna, Barlassina, Monza, Verano, Vimercate, Gorgonzola, Gallarate, Cuggiono, Busto, Arsizio, Soma, Melzo, Melegnano. The only town, besides Milan, is *Monza*, ten miles N.E. from Milan, with about 10,000 inhabitants, a fine old cathedral, a royal palace, and a valuable collection of archives.

MILA'NO, the capital of Lombardy, stands in the midst of a vast plain, between the rivers Olona and Lambro, with which it communicates by a canal called Naviglio Grande, which flows all round the original old town, of which it marks the boundary. The modern town surrounds the old town, and extends ten miles in circumference: it has a line of ramparts planted with trees. The population of Milan is about 150,000. The widest and finest streets are in the external part of the town, or suburbs: those which lead to the principal gates are called Corso, and serve as fashionable promenades. The streets of the old town are mostly narrow and irregular. The Duomo, or cathedral, stands nearly in the centre of the town. This magnificent building was begun by Visconti, Duke of Milan, in March, 1386, and is not yet quite finished. The exterior, with its hundred spires and its three thousand statues of various sizes, looks like a forest of marble. The style of architecture is a kind of florid or modern gothic; the front is of a mixed style. The interior is vast and imposing, and not loaded with ornaments. There are 520 steps to ascend, in order to reach a gallery which runs round the principal spire, from which there is a most splendid view of the whole Lombard plain, and of the chain of Alps which borders it in the form of a crescent on the north side.

Milan is a gay, thriving city: its markets are abundantly supplied with every luxury. Numerous coffee-houses, splendid hotels, abundance of handsome carriages, several theatres (among

which is La Scala, one of the largest in Europe), well supplied with actors and singers,—all attest the habits of a luxurious capital. But Milan is also a centre of learning: it is the place of residence of several of the best Italian writers, and more books are published yearly at Milan than in all the rest of Italy. The fine arts are successfully cultivated at Milan, as the annual exhibition of the works of living artists proves. The museum of Brera contains several excellent paintings of the great masters; and the Ambrosian Library is well known for its numerous and valuable MSS.

Milan abounds with charitable institutions. The great hospital, one of the finest and largest in the world, has been richly endowed by numerous benefactors.

The manufactures of Milan consist chiefly of silks, printed cottons, plate-glass, jewellery, artificial flowers, soap, and leather.

Milan is an archbishop's see, and has a court of appeal, a tribunal of prima istanza for civil and another for criminal matters, and a commercial tribunal, called 'Tribunale Mercantile e di Cambio.'

The public gardens, the ramparts, the great parade, which occupies the site of the old citadel, and the several avenues planted with trees which lead from the gates in various directions, afford pleasant walks and rides. There is a large circo, or amphitheatre, occupying an oval 800 feet in length.

Milan is rich in beautiful buildings. Among the palatial residences are—the Palazzi Arcivescovile, Visconti, Annone, Finanzi, Belgioioso, and Belloni. The Arco della Pace is one of the most splendid buildings in Milan. It was carried on by its architect, Cagnola, from 1807 till 1833, and finished by Londinio in 1837. It stands on the north-west side of the city, where it forms the entrance from the road of the Simplon. The arch, which is entirely faced with marble, and highly enriched in every part with reliefs and sculptures, besides statues both upon and in front of the attic, forms an architectural mass whose general dimensions are 72½ feet by 42½ in depth, and 74 in height, or, including the sestiga and statue on its summit, the extreme height is 98 feet. There are other fine entrances to the city; among which are the Porta Ticinense, the Porta Nuova, and the Porta Orientale.

Milan, under the name of Mediolanum, was a town of the Cisalpine Gauls, and is mentioned by Livy (v. 34) and Polybius (b. xi.). It was taken by the consuls M. Marcellus and C. Cornelius Scipio, B.C. 221. Maximianus, the colleague of Diocletian, fixed his residence at Milan, and surrounded it with walls. Valentinian II., Theodosius I., Honorius, and other emperors of the fourth and fifth centuries, resided occasionally at Milan. At the fall of the Western Empire Milan was twice devastated, once by Attila, and afterwards by the Goths under Vitiges, A.D. 539. In the ninth century, under the reign of the Emperor Charles the Fat, the archbishop Anspertus restored the walls built by Maximianus, and thus gave security to the inhabitants. From that time Milan recovered, and grew in population and wealth, and became gradually the principal city of Lombardy.

Milan suffered greatly in the contests between the Italians and Austrians, 1848-49.

MILDEW is a disease which attacks both living and dead vegetable matter, and is believed by the vulgar to be owing to fogs, dews, meteors, and noxious exhalations, but in reality is caused by the ravages of parasitical fungi. This malady is often of little importance to the subjects of its attack, as it appears towards the close of the year, when the most essential of the vital functions of plants are fulfilled, or in such a small degree as to produce no appreciable effect upon the general health of the plants infested. But it very often becomes a most serious evil, destroying the straw of corn, and so preventing the maturation of the grain, ravaging the fields of peas and beans, destroying the hopes of the gardener by seizing upon his peaches and nectarines, especially when forced, and not unfrequently extending its evil influence to the orchards and every description of kitchen-garden crop.

The species of fungi which produce these effects are always very minute, and often of microscopic smallness. The most common are the following:—*Uredo fœtida*, called the Pepper-Brand; *Erineum grisineum*, and other species of the same genus, which overrun the leaves of the mountain ash, the sycamore, &c., forming broad gray, orange, or brown blotches. Various kinds of *Puccinia*, by which the mildew of wheat-straw is caused. *Æcidium cancellatum*, which occasionally does much harm to pear-trees in the orchards of Herefordshire. *Sclerotium*, a hard kernel-like fungus, is a less common but sometimes very troublesome visitor, attacking the leaves of various plants, particularly of the pear-tree. *Cylindrosporium concentricum*, a pulverulent species, which appears in dots arranged in a circular manner upon the leaves of the cabbage. *Acrosporium monilioides*. A frequent cause of the whiteness of leaves and stems in roses, &c. *Botrytis diffusa* and species of the genus *Aspergillus*, whose filaments bear tufts of branches, covered with spores, and is found on onions. *Erysiphe communis*, which forms the mildew of peas.

These causes of mildew being rightly understood, the methods of preventing the evil are sufficiently obvious. To cure intestinal mildew the soil should be neither too rich nor too freely watered, and every precaution should be taken to prevent the spores of the mildewed plants from being communicated to the soil.

As to the schemes of stopping mildew by the application of sulphur, quick-lime, fresh wood-ashes, and similar substances, all of which have been recommended, it does not appear that any advantage follows their employment. When trees are attacked by superficial parasites, the best plan of removing the evil is by cutting off all the mildewed branches and destroying them, together with shreds, nails, or whatever else may have been made use of in training the plants.

MILE. This word is derived from *miliare*, the *mille passus*, or thousand paces, of the Romans. Each pace was 5 feet, and each foot cer-

tainly contained between 11.60 and 11.64 modern English inches. Taking the Roman foot at 11.62 English inches, the original Roman mile was therefore 1614 yards, or nine-tenths and one-sixteenth of an English statute mile, very nearly; while the English mile is a Roman mile and nine-hundredths of a Roman mile.

The English statute mile is 8 furlongs, each of 220 yards, or 40 poles of $5\frac{1}{2}$ yards or $16\frac{1}{2}$ feet each. It is also 80 surveying chains of 22 yards each. It is therefore 1760 yards, or 5280 feet. The square mile is 6400 square chains, or 640 acres.

The remains of the Roman mile and the Gallic or Celtic league [LEAGUE] are found in the itinerary measures of most European countries. The following list (taken from Kelly's 'Cambist,' except the statement of the Roman mile) will show the itinerary measures of various countries, as they are usually reputed in English yards and statute miles. We have placed them in order of magnitude.

	Yards.	Stat. miles.
Ancient Roman mile	1614	.917
Modern Roman mile	1628	.925
English statute mile	1760	1.000
Tuscan mile	1808	1.027
Ancient Scottish mile	1984	1.127
Irish mile	2240	1.273
French posting league	4263	2.422
Spanish judicial league	4635	2.634
French league of 25 to the degree	4860	2.761
Portugal league	6760	3.841
German short mile	6859	3.897
Flanders league	6864	3.900
Spanish common league	7416	4.214
Prussian mile	8237	4.680
Danish mile	8244	4.684
Danzig mile	8475	4.815
Hungarian mile	9113	5.178
Swiss mile	9153	5.201
German long mile	10126	5.753
Hanoverian mile	11559	6.568
Swedish mile	11700	6.648

The metrical mile of 1000 French metres, or one kilometre, or 1093 English yards, is used among the measures of France, Italy, and the Netherlands; the geographical mile, or a sixtieth of a degree of latitude, or about 2025 yards, is used in England and Italy; the geographical league of three such miles, or 6075 yards, is used in England and France; the German geographical mile is four English geographical miles, or 8100 yards; the short mile used in Poland (which is also the league of Brabant) is the geographical league (6076 yards), and the long mile of the same country is the German geographical mile (8101 yards), which is also the length of the mile in Holland. The Arabian mile is 2148 yards; the Chinese li, 632 yards; the Persian parasang, 6086 yards; the Russian verst, 1167 yards; and the Turkish berri, 1826 yards. All the preceding statements relative to modern measures rest on the authority of the work cited.

MILFORD HAVEN. [PEMBROKESHIRE.]

MILHAU. [AVEYRON.]

MILITARY FRONTIER (Hungary). This is the name given to a tract of country which extends from the Adriatic Sea to the Bukowina, between the frontiers of Illyria, Croatia, Slavonia, Hungary, Transylvania, and those of Turkey. Its length is about 1000 miles, from Povile, on the Adriatic, in 16° 48′ E. long., to the defile of Ostocz, in 26° 25′ E. long., and it lies between 44° 7′ and 47° 36′ N. lat.; its breadth varies in different parts: the area is about 18,000 square miles.

This tract is distinguished from the rest of the Austrian monarchy by having its own purely military government. All the peasants are soldiers, of whom, in time of peace, 45,000 men are always under arms. This force was originally intended as a barrier against the inroads of the Turks. By this tenure the peasants hold from the state the hereditary usufruct of their lands. This singular institution secures to the state the services of a great military force (there being above 100,000 men capable of bearing arms), which in time of peace costs the state nothing. These well-trained and disciplined soldiers defend their own frontier against hostile attacks without pay, and in time of war serve the state in the same manner as the rest of the army, and receive the usual pay. They are divided into seventeen regiments of infantry, one of hussars, and one battalion of sailors. The military authority is divided among what are called four general commands, the seats of which are, at Agram for the Croatian frontier; at Peterwardein for the Slavonian; at Temesvar for the Hungarian; and at Hermannstadt for the Transylvanian: the whole is under the supreme direction of the Aulic Council of War at Vienna. According to the military constitution, the generals superintend the civil affairs and the administration of justice. Under the general are the regimental commanders, who are in the place of district authorities; in short, all civil officers hold military rank.

The surface, soil, climate, productions, and manufactures of the military frontier are noticed in other articles. [AUSTRIAN EMPIRE; CROATIA; HUNGARY, &c.] The inhabitants are about 1,250,000, and comprise Croats, Slavonians, Servians, Wallachians, Hungarians, Szeklers, Magyars, Germans, Greeks, Jews, and Gypsies; two thirds of the number belong to the Slavonian race. This district is now (July 1849) one of the scenes of conflict between the Hungarians and the Austrians.

MILITARY POSITIONS are the sites occupied by armies either for the purpose of covering and defending certain tracts of country or preparatory to the commencement of offensive operations against an enemy.

A position is considered as advantageously chosen when it is on elevated ground; when it is not commanded by eminences within the range of artillery (about 1500 yards); and when, from the existence of natural obstacles, as rivers or marshes,

on the wings, it is incapable of being turned, that is, the enemy cannot without making an extensive movement get to the rear of the army by which the position is occupied. In the event of such points of support being wanting, the position, whether it be a plain or an eminence, should have its flanks protected by villages, or by redoubts raised for the purpose. A village, or even a single building on the ground occupied by the army, may become the key of the position; and as not unfrequently on the preservation of this point depends the possession of the field of battle, such point should be well supported by troops and artillery. The highest point of ground, particularly if near the lines of operation (the roads leading to the magazines), may also constitute the key, and it is usually strengthened by one or more redoubts.

It is indispensable that the ground which constitutes the position should afford ample room for the manœuvres of that species of troops in which the strength of the army chiefly lies; and at the same time it may be observed that, in making choice of a position, the ground in front should be as much as possible disadvantageous in that respect for the enemy. Artillery should always be placed where it can act with most effect; and when the ground occupied by an army presents alternately salient and retired points along the front of the line, the batteries should be placed at all such points. Infantry may occupy any kind of ground, but should, if possible, always form a close line: it is usually placed between the batteries; and, if exposed to a distant cannonade, the troops may be drawn up in a trench, the earth from which will serve to cover them without preventing them from marching out in line to meet the enemy. Cavalry must be posted on a level plain, over which it may advance with regularity when a charge is to be made; if compelled to act on broken ground, it is formed in small detachments behind the infantry, through whose intervals it may pass at proper opportunities.

In the choice of positions for offensive operations, such should be taken as have no rivers or broken ground in front; since these would impede the contemplated movements towards the enemy: small inequalities, behind which infantry or cavalry may be concealed, are however advantageous, as they afford the means of occasionally making attacks by surprise. On the other hand, when an army is on the defensive, the front as well as the wings should be protected by every obstacle to the progress of the enemy which nature may present or art can devise: among those afforded by the latter may be mentioned the blocking up of roads by abatis or traverses; preparing countermines, by which, on the enemy's advance, the roads may be destroyed; rendering fords impassable, and even forming inundations by constructing dams across the streams. Good roads, on the other hand, should exist, or should be formed, in the rear, both to facilitate the arrival of supplies from the magazines or depôts, and to favour a retreat, should the latter step become necessary. An army always retires in disorder under the fire of the enemy, and its danger is greatly increased when the retrograde movement is embarrassed by walls, ravines, streams, or other impediments; the divisions then become separated from each other, and some of them are generally cut off by the enemy before they can be supported.

The power of readily appreciating the character of ground for military purposes is what is called, by foreign writers, the military coup-d'œil; and this can only be acquired by a profound knowledge of the tactics of war joined to much experience in the practice of executing military surveys, and of contemplating the appearance of ground from all possible points of view.

MILITARY PUNISHMENTS. We have little knowledge of the manner in which offences against military discipline were punished by the Greeks; but it appears that, for sedition or mutiny, the commander of an army had the power of causing the ringleaders to be seized and instantly put to death. The military law of Athens prescribed the punishment of death for the crime of desertion while on service; yet occasionally, for this serious offence, the party was only imprisoned or sentenced to pay a fine. Whatever might be the power of an Athenian commander over his soldiers in the field, it is probable that he would be very careful to act with a due regard to law; since, at the termination of a campaign, a man who might consider himself unjustly treated could compel his officer to answer for his conduct before a tribunal of his countrymen. Among the Lacedæmonians, cowards and deserters were either put to death or publicly disgraced.

The Romans punished crimes committed by the soldiery with great severity; and, on the occurrence of a mutiny, every tenth, twentieth, or hundredth man was sometimes chosen by lot, but generally only the ringleaders were selected for punishment. Deserters and seditious persons were frequently, after being scourged, sold for slaves; and occasionally the offender was made to lose his right hand, or was bled nearly to death. A centurion guilty of a breach of discipline was deprived of the staff (a vine branch) which he carried as an emblem of authority.

Among the nations of modern Europe the punishments for military offences were till lately no less severe than they were among the Romans. Besides the infliction of a certain number of lashes with cords, soldiers convicted of theft, marauding, or any other breach of discipline which was not punishable with death, were sentenced to run the gauntelope as it was called. For the execution of this sentence the regiment was drawn up in a double line; and each man being furnished with a small stick, generally of osier (except the grenadiers, who used their belts instead of the sticks), the culprit, naked to the waist, was either marched slowly or allowed to run as fast as he could, according to circumstances, from the head to the rear extremity between the two lines, each man striking him as he passed along. The punishment of the knout, in the Russian army, consists in the naked back of the offender being struck repeatedly with a leathern belt.

Besides the punishments of death and trans-

portation, which, for great crimes, are within the scope of military law, in the British army, breaches of discipline are now visited by flagellation, temporary imprisonment, extra drills, extra guards, and the performance of fatigue duties; but the punishments which consist in confinement to barracks and laborious employments, continued during long periods at the discretion of commanders of regiments, have been abolished by an express order from the present commander-in-chief.

While an army is in the field it is evident that breaches of discipline should be punished with extraordinary severity, and that the punishment should follow almost immediately on detection. The usual crime is that of quitting the ranks for the purpose of plundering the country, a circumstance which is generally accompanied by gross acts of violence, often murders, committed on the defenceless people; and no doubt can exist that soldiers guilty of such crimes should be shot or hanged on the spot. The vice of drunkenness in soldiers deserves in general the heaviest punishment: the miscarriage of an enterprise, and defeat, with the loss of numbers of gallant men in an action, may be the fatal consequences of a failure, from inebriety, in the delivery of a report or order. That the trial and, on conviction, the punishment of an offender should be if possible immediate, is also evident: the army may change its position, when, if any delay takes place, it may be impossible for the necessary witnesses to arrive, or these may in the mean time be removed by the accidents of war.

The punishment of flogging is both cruel and disgusting, and, which is worse, it leaves on the skin during life the marks of disgrace, which, if discovered by any accident, cannot fail to produce a prejudice against the individual, how well soever he may have conducted himself subsequently to the infliction. It may be added that many of the soldiers who are drawn up to witness it, can neither avoid sympathizing with the culprit, nor becoming dissatisfied with a service in which they are exposed to such disgrace and suffering.

Sir Charles Napier states, in his 'Remarks on Military Law,' that forty years before the time at which he wrote (1837), he frequently saw from 600 to 1000 lashes inflicted in consequence of sentences of merely regimental courts-martial; and in those days a man who had suffered a part of the punishment was often brought from an hospital when the wounds were barely healed, to receive the remainder. At present, a man cannot be sentenced to receive more than 50 lashes. Sir Charles recommends that the use of the lash be only gradually abolished; the milder punishments being substituted as often as possible. The practice of giving rewards for good behaviour, now so happily introduced in the military service, and the instruction obtained at the regimental schools, will in time, it is hoped, operate a beneficial change in the characters of such men as have not, from nature or from early education, a just sense of moral rectitude, and of the obligations which all are under of punctually and faithfully discharging the duties they owe to their country.

MILITARY TENURES. [Feudal System.]

MILITIA. In Great Britain and Ireland the term is applied particularly to those men who are chosen by ballot to serve for a certain number of years within the limits of these realms.

By the 26th George III. all the previously existing statutes relating to this force were formed into one law. New regulations however were made by acts passed in the 42nd, 51st, and 52nd years of the same reign. The militia of the kingdom, when embodied and in active service, is subject to the provisions of the Mutiny Act, or Articles of War; but when merely called out for annual training they are not subject to any punishment which affects life or limb. The king is empowered to employ the militia in any part of the United Kingdom, but not out of it. The militia of Great Britain may serve in Ireland, and that of Ireland in Great Britain: the period of service for each out of the island to which it belongs, being at most two years. When called into active service the officers rank with those of an equal grade in the regular army, but as the juniors of each grade; and they may receive promotion for meritorious services during a rebellion or an invasion; but no officer of militia can serve on a court-martial at the trial of an officer or soldier of the regular troops.

All persons not labouring under bodily infirmity and not specially exempted, are liable to be chosen for private militia men, and to serve either personally or by substitute.

The militia when embodied is trained and exercised by battalions or regiments twice in a year, and during fourteen days each time, or once in a year for twenty-eight days, at the discretion of the lords-lieutenants or their deputies.

The balloting of the militia has been suspended by successive acts of parliament since 1829. Since this date the commandants and staff only of the disembodied militia have been kept up. The expenditure for this purpose amounts to about 100,000*l.* a year. The number of militia regiments is 76 for England and Wales, 15 for Scotland, and 38 for Ireland.

The *Supplementary Militia* is an additional body of men which was first raised in 1793, for the defence of the country at that juncture. It may still be raised when the necessities of the state require it, and it is subject to the same regulations as the ordinary militia. The *Local Militia* was a body raised in 1809, for the purpose of replacing, in certain districts, the corps of volunteers. By the 52nd George III., this force may be marched to any part of Great Britain in the event of a rebellion or an invasion, and it may be kept embodied till six months after the former is terminated or the latter repelled. Persons enrolled in the local militia cannot be compelled to serve in the regular militia till one year after their period of service in the former has expired.

MI'LIUM, a genus of grasses belonging to the tribe *Agrostideæ*. There is only one British species, *M. effusum*.

MILI'ZIA, FRANCESCO, was born at Oria,

small town in the kingdom of Naples, in 1725, and was of a noble and wealthy family. He ultimately settled at Rome, where he applied himself to the study of architecture, and published his Lives of the Architects, or 'Vite degli Architetti piu Celebri,' in 1768, which was followed by his treatise 'Del Teatro,' in 1772, a production that excited so much scandal on account of certain observations in it, that it was withdrawn, yet was soon afterwards republished at Venice. His 'Principles of Civil Architecture,' first published in 3 vols. 8vo., in 1781, and considerably improved in the third edition at Bassano, 1785, greatly extended his literary reputation, being, at the time of its appearance, almost the first attempt to base the art on rational principles. He wrote other works on architecture and the fine arts, some of which have been condemned for the contempt which they evinced for the opinions of high authorities. He died at Rome, in March, 1798.

MILK is an opaque fluid, secreted by the mammary glands of the females of the animals belonging to the class Mammalia, and adapted to the nourishment of their young offspring. It is of a specific gravity somewhat greater than that of distilled water, and possesses a peculiar odour. It consists, in addition to the watery portion, serum, &c., of globular particles, which are not more than half the size of the globules of human blood, having a diameter of about one ten-thousandth of an inch. They are composed of a fatty matter (butter) and a coagulable substance, which in many points resembles albumen, termed *caseine*, or the matter of cheese.

Milk has been ascertained by various analyses to be a compound fluid, chiefly consisting of oil, sugar, and protein.

The milk of cows or other animals is extensively used as the food even of adults, and, though insufficient alone, is a most valuable ingredient of diet. In order to render it like human milk, sugar and water must be added.

Though cheese is in general difficult of digestion, fresh-pressed curd is often found to suit the stomach of persons affected with disease of that organ.

Milk may be brought to a dry state, and powdered, in which condition it keeps for a length of time; and by dissolving it in tepid water an artificial milk may be formed, capable of being used at sea, particularly for children during long voyages.

Milk is also used as an antidote in cases of poisoning by some metallic salts, such as corrosive sublimate, perchloride of tin, sulphate of copper, &c.

MILKY WAY. The Milky Way may be described in general terms as extending three or four degrees on each side of a great circle of the heavens, inclined at an angle of about 60° to the ecliptic, which cuts in the northern hemisphere between the horns of Taurus and the feet of Gemini, and in the southern hemisphere between Sagittarius and Scorpio. Beginning with the part nearest to the North Pole, it nearly covers Cassiopeia and Perseus, and then, becoming thinner, passes through Auriga, between Taurus and Gemini, and near the back of Canis Major through Argo. It then narrows considerably, and passing under the hind feet of Centaurus, widens again near Ara. A little above the last constellation, and before it again meets the ecliptic, it divides into two streams, which contain between them a long thin strip passing through part of Scorpio, Serpens, Aquila, Vulpecula, and Cygnus. In Cygnus the streams reunite, but immediately separate again, finally reuniting higher up in the same constellation, whence the main stream reaches Cassiopeia, &c.

The Milky Way was called by the Greeks *γαλαξίας, κύκλος γαλακτικός* (whence our word *Galaxy*), and by the Romans *Orbis Lacteus*. Some of the Pythagoreans are reported to have supposed the Milky Way to be an old and disused path of the sun, out of which, some said, he was frightened by the banquet of Thyestes; others, a reflexion from the sun. Anaxagoras is said to have thought it was the shadow of the earth: Aristotle supposed it to be sublunary, and to consist of exhalations, of the same matter as comets. Posidonius took it for a band of fire; Theophrastus for a solid and luminous band, joining together the two hemispheres; while Diodorus thought it was celestial fire shining through the clefts of the solid heavens. Democritus hit the true explanation, namely, that it is a congeries of little stars too small to be separately seen—an opinion which both Plutarch and Manilius mention. Shortly after the invention of the telescope, Galileo announced that he had resolved the whole of the Milky Way into stars. It is, however, not easy to suppose that Galileo's resolution of the Milky Way was complete; and we may here see how necessary is attention to minute description. When Sir J. Herschel states the stars to appear 'like glittering dust *on the black ground of the general heavens*,' we know that, if the observer can be depended upon, he has completely resolved the continuous light in question: but if he only says, with Galileo, that he detected innumerable stars, we are only sure that he has distinguished the nearer stars, and may suppose that the more distant ones still formed a Milky Way behind them. That this must have been the case with Galileo (whose telescopes would never distinctly show Saturn's ring) may be confidently asserted. It must also be remembered that Galileo had completely resolved several nebulæ, and might easily have completed his assertion as to the Milky Way from analogy. Kepler ('Dioptr. Pref.') describes this resolution in a way which will be some guide as to its character: 'Nebulosa stella ostendit, ut in Via Lacteâ, duas, tres, vel quatuor clarissimas stellas in arctissimo spatio collocatas;' that is, two, three, or four stars were seen in the smallest space. Sir W. Herschel counted 79 stars, on the average, in a field of fifteen minutes in diameter, showing about as much of the heavens as is covered by one-fourth part of the moon. If, which may be suspected, the 'arctissimum spatium' of Kepler meant the field of his telescope, the resolution thus obtained would not quite justify the conclusion, except as a probable

deduction; the real and necessary inference would only have been, that stars invisible to the naked eye exist in every part of the Milky Way in considerable numbers.

MILL, JOHN, was born at Shap, in Westmorland, about 1645. He took his degree of B.A. in 1666, at Queen's College, Oxford, and of M.A. 1669. He was shortly afterwards chosen a Fellow of his college. He obtained some clerical preferment; and in 1685 he was appointed Principal of St. Edmund's Hall, which office he held till his death, which happened June 23, 1707.

Mill is known by his edition of the Greek Testament, which was published only fourteen days before his death, with the following title: 'Novum Testamentum Græcum, cum Lectionibus variantibus, MSS. Exemplarium, Versionum, Editionum, SS. Patrum et Scriptorum Ecclesiasticorum, et in easdem Notis.' This edition was the labour of thirty years.

MILL, JAMES, was born at the North-Water Bridge, about 7 miles from Montrose, April 6, 1773. He was sent to the university of Edinburgh, where he was educated for the church. He was licensed to preach about 1798; but he changed his views, and in 1800 accompanied Sir John Stuart to London, where he settled. He became editor of 'The Literary Journal,' and for several years was an occasional contributor to the 'Edinburgh Review.'

His 'History of British India' was commenced about 1806, but, being a work of great research, it was not published till the winter of 1817–18. In consequence of the ability and knowledge of the subject displayed in his History, and although he had in some parts of it freely censured the conduct of the East India Company, the Court of Directors, in 1819, intrusted to him the chief conduct of their correspondence with India, in the revenue branch of administration. He afterwards rose to be head of the department in the India House of correspondence with India.

Mr. Mill had in the meantime become a contributor to the 'Supplement to the Encyclopædia Britannica,' his principal contributions to which were the articles on Government, Education, Jurisprudence, Law of Nations, Liberty of the Press, Colonies, and Prison Discipline. His 'Elements of Political Economy,' was published in 1821–2. In 1829 he published his 'Analysis of the Phenomena of the Human Mind,' a work on which he bestowed more of the labour of thought than on any other of his productions. His last work was the 'Fragment on Mackintosh,' published anonymously in 1835. He died at Kensington, June 23, 1836.

MILLAU. [Aveyron.]

MILLAR, JOHN, son of the Rev. James Millar, minister of Shotts, in Scotland, was born in that parish, June 22, 1735. He was sent to Glasgow College, and afterwards became preceptor to the eldest son of Lord Kames. In 1760 Millar passed advocate, but abandoned his prospects at the bar; and an opportune vacancy having occurred in the chair of civil law at Glasgow college, he obtained that situation the following year. He now devoted himself entirely to the duties of his new sphere, and by his conduct in it raised the class from a very low and languid condition to be the most popular of the law chairs in the kingdom.

Although most of his lectures were attended with interest, yet remarking a more than ordinary degree of attention manifested to such of them as referred to the progress of society and government, Mr. Millar was induced from this circumstance to publish a short treatise on the subject. This he did in 1771, and the work was favourably received. In 1787 he published his 'Historical View of the English Government, from the settlement of the Saxons in Britain to the accession of the House of Stuart.' He died May 30, 1801.

MILLE'NNIUM, a Latin word meaning a period of a thousand years, is applied by ecclesiastical writers to the period during which it is predicted in Scripture that the Church will be in a state of extraordinary prosperity, and which is to be preceded by the overthrow of her enemies, accompanied at its commencement by the first resurrection, or the resurrection of the saints, and followed by the destruction of Gog and Magog, and the general judgment (Rev. xx.).

Respecting the state of the church during the Millennium two opinions are held, both of which can be traced up nearly to the earliest ages of Christianity. The one is that Christ will reign in person upon the earth at Jerusalem, that the saints will reign with him and enjoy corporeal pleasures, and that the Jews will be restored to Palestine and exalted to the first rank among the nations of the world. On the other hand it has been held that the passages of Scripture in question must be taken in an allegorical sense, and that the Millennium will only be distinguished by the universal diffusion of pure Christianity in the world, and a consequent decrease of physical and moral evil.

MILLEPO'RIDÆ, the name of an extensive family of Stone-Making Polypes, or Coral-Animalcules, the characters of which are thus laid down by De Blainville:—

Animals in general very slender, and provided with a single circle of slender tentacula; cells sometimes of considerable size, but always without lamellæ or striæ within or without the tubes; polyparium fixed, varying in shape. Retrenching from the group the palmated kinds (to form the genus *Palmipora* among the *Madrephylliæa*), there remain, according to De Blainville, 23 genera, which are thus arranged:—

1. *Cells polygonal, often rather large.*—Favosites (Eunomia), Alveolites, Apsendesia, Theonea, Pelagia, Terebellaria, Polytrema, Frondipora, Lichenopora.

2. *Cells round, very fine, poriform, immersed.*—Orbiculites, Marginopora, Stromatopora, Tilesia, Spinopora, Chrysaora, Ceriopora, Distichopora, Heteropora.

3. *Cells round, more or less tubular.*—Pustulopora, Hornera, Idmonea, Cricopora.

Many of the forms are known only in a fossil state, as *Favosites*, found in the strata of the transition and carboniferous eras, *Apsendesia* and *Terebellaria*, from the oolite of Caen, &c.

MILLER, JOHANN MARTIN, born at Ulm

(where his father was preacher in the cathedral and professor of Oriental languages), Dec. 2, 1750, began to study theology in 1770 at Göttingen. After taking orders, he was appointed preacher at the cathedral of his native town in 1783, and in 1797 professor of theology at the Gymnasium. In 1810 the king of Würtemberg bestowed on him the deanery of Ulm. He died June 21, 1814.

His romance of 'Siegwart' (first published in 2 vols., 1776) met with astonishing success. The excess of sensibility and sentiment which characterises his romances qualified him well for an elegiac and lyric poet, and in that character he must always be remembered.

MILLET, a plant which botanists class among the grasses, though, in some species and in favourable situations, it attains the height of 18 or 20 feet. The stalk of all the species of millet resembles a jointed reed, having at every joint a long broad leaf, which embraces the stalk with its base. The plants are all annuals; and grow quickly, yielding an abundance of small grains which are set round a compact spike at the top of the stalk. The stalk itself is filled with a saccharine juice.

Millet thrives best in a light sandy soil, and if sufficient space is allowed between the plants to weed and hoe them during their early growth, they will afterwards overtop and smother all weeds, and yield an abundant return with little labour and without much manure. The seeds however require a climate warmer and drier than that of England to ripen properly. Millet is cultivated largely in the southern parts of Europe —in Spain, Italy, the south of France, Switzerland, and Southern Germany; but it is grown most extensively in the East Indies, China, Arabia, Syria, Egypt, and Nubia. It has also been introduced into the West Indies, where it is called *Guinea Corn*.

In the East millet is used as food for men; but in Europe, though it is sometimes made into loaves and cakes, and frequently into puddings, it is mostly used for feeding poultry and domestic animals. The leaves and panicles are given, both green and dried, as fodder to cattle.

The common East Indian millet is the *Holcus Sorghum* of Linnæus. [Sorghum.]

MILLIDGEVILLE. [Georgia.]

MILLIN, AUDIN LOUIS, born in 1758, was an eminent French antiquary, who succeeded Barthélémi as keeper of the antiquities and medals in the Royal Library at Paris. His 'Dictionnaire des Beaux Arts,' 'Dictionnaire de la Fable,' 'Monumens Antiques,' and 'Galérie Mythologique,' are all useful contributions towards archæology and the fine arts. Besides these and other works, his 'Magasin Encyclopédique' was a highly valuable literary journal. He died August 14, 1818.

MILLINGEN, JAMES, was born in London, Jan. 18, 1774. He was sent to Westminster School, where he showed a great partiality to the study of numismatics and military science. When the French Revolution broke out, he repaired with his father (who was an enthusiastic admirer of liberty) to Paris, where he obtained employment as a clerk, and spent his leisure hours with such men as the Abbé Barthélémi, Barbié du Bocage, Walckenaer, and D'Aumont. He suffered imprisonment with the rest of the English who were seized by order of the National Convention; and in confinement became acquainted with Charles Este and Sir Robert Smith, with whom he afterwards joined in the formation of a bank in Paris, which subsequently failed, and Millingen was thrown on his own resources. His perfect knowledge of coins and the relics of ancient art had in the meantime made his name known throughout Europe, and he made a considerable sum by purchasing by weight, from some labourers who had discovered a Roman entrenchment near Abbeville, a quantity of Roman gold coins. He spent the last twenty years of his life in Italy, where an asthmatic complaint to which he was subject made it convenient for him to reside. He died in London, Oct. 1, 1845, a few months after his return. His chief works, in addition to essays in various periodical works, are 'Recueil de Quelques Médailles Grecques inédites,' 'Medallic History of Napoleon,' 'Ancient Coins of Greek Cities and Kings,' 'Considérations sur la Numismatique de l'Ancienne Italie.'

MILLSTONE-GRIT, a group of strata which belong to the carboniferous system, and separate the coal formation from the mountain limestone. We have in the millstone-grit group evidence of streams from the interior of elevated lands and periodical currents which spread pebbles, sand, and clay, with land-plants, over surfaces where previously corals and shells were accumulated in the quiet sea. It extends at intervals from the north of England to the south-west. The rock from which the group is named, the millstone-grit, is a very coarse-grained quartzose sandstone, with layers of pebbles, often defining the upper or under surfaces of beds, and sometimes containing remarkable masses of laminated mica, which is not common in the substance of the stone. It is a reaggregated mass of the disintegrated materials of granite. The organic remains are a mixture of those belonging to the coal formation (plants) and those of the subjacent limestone (conchifera, mollusca).

MILNER, JOSEPH, was born in the neighbourhood of Leeds, Jan. 2, 1744. He was sent to the grammar-school at Leeds, where his industry and talents were conspicuous, and, his father having died in narrow circumstances, by the assistance of some gentlemen in Leeds he was enabled to enter Catherine Hall, Cambridge, at the age of eighteen. In 1766 he took his degree of B.A., and gained the chancellor's second gold medal for classical knowledge. He then became assistant in the Leeds grammar-school, and afterwards officiated as curate at Thorp Arch, near Tadcaster. About the year 1770 he embraced the sentiments of the evangelical party in the church of England. In 1780 he became vicar of North Ferriby, near Hull, and a few weeks before his death he was chosen vicar of Hull by the mayor and corporation. He died Nov. 15, 1797.

The work by which he is best known is the 'History of the Church of Christ,' which was commenced by himself, and completed by his brother, the Dean of Carlisle. The first edition of this work appeared in 5 vols. 8vo., 1794 to 1812. A complete collection of his works was edited by the Dean of Carlisle, 8 vols., 1810.

MILNER, ISAAC, dean of Carlisle, and brother of Joseph Milner, was born in 1751. His brother took him under his own tuition, and in 1770 Isaac entered Queen's College, Cambridge, where he took his degree of B.A. in 1774, and was Senior Wrangler. In 1775 he was elected Fellow of Queen's College, and in 1783 Jacksonian Professor of Experimental Philosophy; in 1788 he became D.D., and was elected Master of Queen's College. In 1798 he was appointed Lucasian Professor of Mathematics; and in 1791 Dean of Carlisle. He was twice Vice-Chancellor, in 1792 and 1809. He died at the house of Mr. Wilberforce, at Kensington Gore, on April 1, 1820. He published several theological works, besides scientific papers in the 'Philosophical Transactions;' and two volumes of his Sermons were published after his death.

MILLSTREET. [Cork.]

MILO', MELOS, one of the larger Cyclades in the Ægean Sea, about 70 miles north of Crete, and 65 east of the Peloponnesus. It is 14 miles long from east to west, and its breadth is about eight miles. Its northern coast is indented by a deep bay, which forms a natural harbour, one of the best and safest in the Levant. The island is mountainous, and of volcanic formation; it has hot mineral springs, and mines of sulphur and alum. The soil produces abundance of fruit, wine, oil, and pasture for cattle. The population at present is small.

There are extensive remains of the ancient capital of the island, Melos, near the great harbour, consisting of part of an amphitheatre, cyclopean walls, a temple of Venus, and numerous subterranean galleries. A fine statue of Venus, found at Melos, is in the Louvre at Paris.

MI'LTIADES was the younger son of Cimon (who was sprung from a noble Athenian family), and nephew of the elder Miltiades, who, during the life of Pisistratus, had founded a tyranny, or arbitrary government, in the Thracian Chersonese. The elder Miltiades had been succeeded by Stesagoras, the elder son of Cimon, on whose death the young Miltiades succeeded to his place. During the Scythian expedition of Darius, B.C. 513, when the Greek commanders who guarded the raft over the Danube debated whether they should not cut off the Persian king's retreat, Miltiades advised the destruction of the bridge.

In B.C. 490, the second Persian armament under Datis and Artaphernes was sent against Greece, and, guided by the exiled tyrant, Hippias, landed in Attica, on the plains of Marathon. [Marathon.] According to custom, the Athenian army was under the direction of ten generals, each of whom took the command for one day in turn. One of the ten was Miltiades, and when the day of command came round to Miltiades, the battle took place. The Persians with much superior force were entirely defeated by the Athenians and their allies the Platæans. The vanquished perished in thousands, by the sword, in the marshes, and in attempting to embark on board their ships; and the Athenians and their allies the Platæans were left completely masters of the field.

Miltiades appears next at Paros, to which he laid siege with seventy Athenian ships. The Parians defended themselves bravely, and Miltiades was compelled to retire. On his return to Athens, while still suffering from a wound, he was accused, tried, and condemned for deceiving the people. The punishment was commuted for a fine; but, being unable to pay it, he died in prison.

(Herodotus, lib. v., vi.; Cornelius Nepos, whose biography of Miltiades is of no value.)

MILTON. [Kent.]

MILTON, JOHN, son of John and Sarah Milton, was born December 9, 1608, in Bread Street, London. His education appears to have been sedulously conducted; first under a person of Puritan opinions named Young, who was master of Jesus College, Cambridge, during the Protectorate, and afterwards at St. Paul's School, under Alexander Gill. He entered at Christ's College, Cambridge, Feb. 12, 1624. He stayed at Cambridge seven years, and after having declined both the church and the bar, he retired to his father's house at Horton in Buckinghamshire, where, during a residence of five years, he read over all the Greek and Latin classics, and, as it is supposed, wrote his 'Arcades,' 'Comus,' 'L'Allegro,' 'Il Penseroso,' and 'Lycidas.' In 1637, on the death of his mother, Milton travelled into Italy, during which journey he was introduced to Grotius, to Galileo, and to Tasso's patron, Manso. He was absent about fifteen months, and when he returned he devoted himself to the education of his nephews, John and Edward Phillips, and to the politics of the day.

In 1641 Milton began his political career by writing a treatise 'Of Reformation,' which was followed in the same year by those on 'Prelatical Episcopacy,' 'The Reason of Church Government urged against Prelacy,' and some animadversions on a tract of Bishop Hall's, and in the next by 'An Apology for Smectymnus.'

In 1643 he married his first wife, who was the daughter of a country gentlemen of Oxfordshire. Not long afterwards his conjugal troubles began by the refusal of his wife to return to him from a visit to her father. He accordingly repudiated her, and in 1644 and 1645 published four treatises in justification of his conduct. The former year is also remarkable as that in which he produced his 'Tractate on Education,' and that most able of all appeals, the 'Areopagitica or a Speech for the Liberty of Unlicensed Printing.' About this time Milton was reconciled to his wife, whose family had been reduced to distress by their devotion to the royal cause. His pen was silent until after the execution of Charles, when he produced a tract on 'The Tenure of Kings and Magistrates; proving that it is lawful to call to account a Tyrant or Wicked King,' &c. This was followed by 'Observations

on the Articles of Peace, and Animadversions on the Scotch Presbytery at Belfast,' in the same year (1649). His next work, 'The History of England,' was interrupted by his appointment to the post of Latin secretary to the Council of State. Upon the death of his first wife he married a daughter of Captain Woodcock of Hackney, who died in childbed within a year after their marriage. In 1654, or perhaps before that time, he became totally blind.

The duties of his office, occasional pamphlets on politics, and his 'History of England,' which did not appear till 1670, employed him till he began 'Paradise Lost.' At the Restoration he retired into obscurity. Having obtained indemnity under an act passed in 1660, he married his third wife, Elizabeth Minshull; and in 1665, according to Elwood the Quaker (who acted in some measure as his secretary), he had completed 'Paradise Lost,' which was licensed and published in 1667. Five pounds were paid by Samuel Simmons, the bookseller, for the copy, with a promise of five pounds more when 1300 copies should have been sold, of the first, second, and third editions respectively. The 'Paradise Lost' first consisted of only ten books. The division into twelve was made in the second edition, published in 1674, three years before which time he had produced 'Paradise Regained' and 'Samson Agonistes.'

In 1673 he published a 'Summary of Logic' and a treatise 'Of True Religion,' &c.; and in 1674 his Latin letters and exercises. His last work was a translation of the Polish declaration in favour of John III. He died Nov. 8, 1674, and was buried in the chancel of St. Giles Church, Cripplegate.

Milton belonged to the Independents, a name in his time expressive both of religious and of political tenets. The editions of his poetical works are very numerous. His prose works have been much neglected, and we are not aware that a uniform edition, including the tract on Christian Doctrine, has yet appeared.

MILTON ABBAS. [Dorsetshire.]

MILVUS. [Falconidæ.]

MIMNERMUS OF CO'LOPHON, a Greek elegiac poet, contemporary with Solon. In the few remaining fragments of Mimnermus he complains of the briefness of human enjoyment, the shortness of the season of youth, and of the many miseries to which man is subject. The fragments of Mimnermus have been several times edited, in the collections of Stephens, Brunck, Gaisford, and Boissonade, to which may be added Bach's separate edition, published at Leipzig in 1826.

MIMO'SEÆ are a division of the Leguminous order of plants. The principal genus of the division is the *Acacia*. *Mimosa* itself consists of a considerable number of species, many of which are remarkable for the irritability of their leaves, a curious property which has always rendered them objects of interest. [Sensitive Plants.] Among the useful plants belonging to *Mimoseæ*, and not included in the genus *Acacia*, are the *Inga saipida*, *dulcis*, *biglobosa*, and some others, whose pods contain a sweet nutritious fæcula, which renders them fit for food; and several kinds of *Prosopis*, the astringency of whose pods and bark renders them valuable for tanning purposes.

MINARET (from the Arabic *menarah*, a lantern), in Turkish and Eastern architecture, a very slender and lofty turret, having one or more projecting balconies around it, that divide it externally into two or more stories. They are used in Mohammedan countries for the purpose of calling the people to prayers, and therefore serve the purpose of belfries; but they are also frequently added merely for ornament.

MINAS GERAES. [Brazil.]

MINCHINHAMPTON. [Gloucestershire

MINCIO. [Po.]

MINDEN, the most eastern of the three governments into which the Prussian province of Westphalia is divided, has an area of 2024 square miles; the population in 1847 was 459,833. The soil is of unequal quality. There are some barren spots, but the greater part is fertile in corn: hemp and flax also are generally cultivated, linen and thread being the chief industrial products. The pastures are good, and cattle abound. Iron, lead, and salt are the most important mineral products. The Weser is the principal river, and the trade on its banks is very considerable. The Lippe drains the southern part of the government.

Minden, the capital of the government and a strongly fortified town, is situated 37 miles by railway W. from Hanover, in 52° 18′ N. lat., 8° 53′ E. long., on the left bank of the Weser, here crossed by an old bridge 600 feet long. It is one of the oldest towns in Germany. The streets are narrow and irregular; the old-fashioned houses are in general built of stone or brick. The Domplatz or cathedral-close, is a handsome square, planted with trees. Among the public buildings, the largest and handsomest is the Roman Catholic cathedral, which was completed in 1072; it is built in the lower part of the town, on a foundation made with piles. Besides the gymnasium and a seminary for schoolmasters, there are several public schools, and other useful institutions. The manufactures are woollen stuffs, linen, leather, tobacco, sugar, vinegar, beer, and brandy. In the vicinity there are oil and saw mills. The population of the town exceeds 8000. The French were defeated near Minden on the 1st of August, 1759, by an Anglo-Hanoverian force under Prince Ferdinand.

Paderborn, the capital of the old principality of Paderborn, now included in this government, is an ancient gloomy town with about 8000 inhabitants, situated about 40 miles S. from Minden, on a railroad now in course of construction which joins the Cologne-Minden line to the railway that passes through Cassel, Gotha, and Leipzig to Dresden. The town, which is built at the source of the Pader, a feeder of the Lippe, is surrounded by a wall pierced with 5 gates. The cathedral is the principal building; the former university is now a Roman Catholic theological college. Paderborn gives title to a Roman Catholic bishop.

Herford, 15 miles S.W. by railway from

Minden, on the Werra, a feeder of the Weser, is a walled town, with a gymnasium and 6900 inhabitants, who manufacture cotton twist, tobacco and leather.

The only other town of importance in the government of Minden is BIELEFELD.

MINDORO. [PHILIPPINES.]

MINE. [MINING.]

MINE'LLIUS, JOHN, was born about 1625, at Rotterdam, and died in 1683. He was rector of the public school in his native town, and edited many of the Latin classics, with short notes for the use of schools.

MINERAL WATERS. [WATER.]

MINERALOGY is the art of distinguishing mineral substances from each other. It includes the chemical composition of bodies, and an account of their external or physical properties. Both are requisite, for substances occur which agree in their chemical composition, and exhibit differences in their external characters; while there are other bodies which differ in their chemical constitution, but agree in their external properties.

Various methods of arrangement of minerals have been proposed by different authors. According to Werner, minerals were divided into the four classes of earthy minerals, saline minerals, inflammables, and metals: Karsten classed them under the heads of earths, salts, combustibles, and metals: Haüy divided minerals into acidiferous earthy substances, earthy substances, non-metallic combustible bodies, metallic bodies, substances not sufficiently known to admit of classification, rocks, and volcanic products; Phillips's classes are, earthy minerals, alkaline-earthy minerals, acids, acidiferous earthy minerals, acidiferous alkaline minerals, native metals, metalliferous minerals, and combustible minerals; Berzelius made a chemical classification.

Minerals may be classed as *crystallized*, *imperfectly crystalline*, *massive* with definite forms, and *amorphous* without definite forms. The *structure* of bodies may be compact, granular, fibrous, foliated, earthy, scaly, or laminar, and these characters are applicable both to crystallized and massive minerals. *Fracture* is a very distinguishing characteristic in many cases. The principal fractures are the conchoidal, earthy, uneven, coarse, fine-grained, splintery, hackly, and irregular. The *hardness* differs greatly, and has been subjected to an approximate classification. The *specific gravity* and the *colour* differ exceedingly. The *colour of the streak* (analogous to a pencil mark) sometimes resembles that of the mineral itself, but is often extremely different, so that it is impossible to foretel what it is likely to be. *Transparency* is exhibited in various degrees, expressed by transparent, semi-transparent, translucent, translucent on the edges, opaque: it is also to be observed that some transparent bodies are doubly refractive. The *lustre* of minerals is described as vitreous, resinous, metallic, adamantine, pearly, resinoso-metallic, and vitreo-resinous. When perfectly devoid of lustre, the mineral is described as dull. *Electricity*, *magnetism*, and *phosphorescence*, are exhibited in different degrees by minerals.

Besides the above more general and distinctive characters, the elasticity and flexibility of minerals are sometimes described; thus mica is flexible and elastic, while talc is flexible but not elastic. The touch, smell, taste, and adhesion to the tongue of minerals, are in some (but comparatively few) cases mentioned by mineralogists.

The principal minerals are mentioned under their respective names. See also CRYSTALLOGRAPHY.

MINE'RVA, or MENE'RVA, an ancient Italian divinity, known to the Greeks as Pallas Athene. [ATHENE.] Her attributes corresponded in most respects to those of the Grecian goddess. She was the patroness of arts and industry, such as spinning and weaving, and was the goddess of all the mental powers.

MINERVINO. [BARI, TERRA DI.]

MINES are openings in the ground from which anything is dug. Until an opening is made, the name is not properly applied, though the term is now generally used to signify coal, lead, iron, and so forth, before an opening is made for digging them out.

Mines belong to the tenant in fee-simple of the land, with the exception of gold and silver mines, which belong to the king by his prerogative, but by 1 Wm. & Mary, c. 30, a mine of copper or tin is not to be considered a royal mine, though silver be extracted from the ore. The owner of land in fee-simple is the owner of everything which lies in a perpendicular direction under the surface to any depth. A tenant for life, unless his estate is without impeachment of waste, cannot dig earth, lime, clay, or stone, except for the repair of buildings or the manuring of the land. He cannot open a new mine, but he may work mines which are already open, and he may open new shafts for working veins of coal which have been already worked. A tenant in tail can cut down timber or open mines.

The freehold of all copyhold lands is vested in the lord, and consequently the mines. In some cases a copyholder of inheritance has by the custom of the manor a right to the timber, and the lord has no right to dig mines, unless there be a custom which gives him the right.

The Act 7 & 8 Geo. IV. c. 30, s. 6, 7, enacts certain punishments for malicious injuries done to mines.

MINES, MILITARY, are excavations made in the rampart of a fortress, or under ground, in order to contain gunpowder, which, being exploded, the rampart may be breached, or any works of the enemy, above or near the mine, may be destroyed.

Two kinds of mines were anciently employed in the attack of fortresses. One of them was merely a subterranean passage carried under the walls from the exterior ground; and being suddenly opened within the town, the assailants were enabled to enter the latter by surprise. The other kind was executed in a similar manner, and was intended to lay the rampart of the place in ruins; for this purpose, the gallery, having been driven as far as the walls, was carried on to the right and left under the walls, which were supported by props of timber till the time ap-

pointed for the assault was come; then, the props being drawn away or consumed by fire, a portion of the rampart fell into the ditch; and the troops, who were kept in readiness, passed over the ruins into the town.

Gunpowder was, in 1487, used in military mining by the Genoese at the siege of Serezanella, a town belonging to the Florentines; and Peter of Navarre, a Spanish engineer, formed mines with gunpowder at the siege of Cephalonia, near the end of the 15th century. By means of 1173 mines, great and small, the Venetians defended Candia during more than two years (1666 to 1669) against the whole power of the Turks.

In the siege of any place the mining operations of the besiegers are directed to the discovery and destruction of the galleries of countermines; to the blowing up of any advanced works belonging to the garrison; to the demolition of the wall of the counterscarp, in order that the descent into the ditches may be facilitated; and, occasionally, to the formation of breaches in the principal ramparts. On the other hand, the countermines are employed by the defenders to destroy the trenches and batteries of the besiegers beyond the foot of and upon the glacis; and also the lodgments which may be made on the breaches or within the works.

The chamber in which the powder is placed is a cubical excavation formed on one side of the gallery, very little larger than is necessary to enable it to receive the box which contains the powder. When this is deposited, the vertical face of the chamber is covered with boards, which are kept in their places by short timbers fixed in horizontal positions between them and the opposite side of the gallery. The gallery is then filled up with earth, well rammed, to an extent in the length of the gallery greater than that of what is called the line of least resistance, that is, a line imagined to be drawn from the chamber perpendicularly to the surface of the ground above. The mass of earth thus filling the gallery is called the *tamping* of the mine. A train of powder in a cloth hose, forming a tube about three-quarters of an inch in diameter, and for security contained in a wooden trough called an *auget*, or a *casing-tube*, is laid from the box in the chamber through the tamping to the place where the fire is to be applied; to its extremity is attached a piece of port-fire, as it is called, which, being lighted, the fire communicates by means of the train with the powder in the chamber, and an explosion takes place. Occasionally, of late, such mines have been fired by means of a galvanic current. Every explosion of this kind necessarily produces a compression of the earth in all directions about the chamber, to a certain extent; and the mines formed with high charges of powder, have been denominated *globes of compression* from this circumstance. The object of such mines is, by compressing the earth laterally to a considerable extent, to destroy a side wall of an enemy's gallery, or blow down the counterscarp of a ditch.

The rules for determining the charges of mines are founded on the results of experiment. When a mine having the upper diameter of the excavation equal to twice the depth of the charge is formed in common earth, the amount of the charge in pounds is considered as very nearly equal to one-tenth of the cube of the line of least resistance in feet. In an experiment made at Potsdam, in a sandy soil, when the diameter of the excavation was four times the depth of the charge, the cube of the line of least resistance in feet was very nearly equal to the charge in pounds. According to the latest experiments of the French engineers, the charges of powder necessary to remove one cubic yard (English) of material are as follows:—

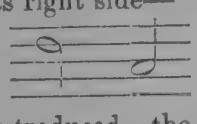
Common earth .	1.21 pounds (English)
Potters' clay . .	1.75 „
Freestone . .	2.14 „

MINGRELIA. [Georgia.]

MINHO. [Portugal.]

MINIATURE, in popular language, signifies a very small portrait, let it be executed in whatever mode it may,—as, for instance, in enamel, on the lid of a snuff-box, &c. A very small portrait in oil is likewise so termed. But miniature painting, properly so named, is in water-colours, though it is not at all similar in its process to that employed in water-colour drawings in general. Instead of being applied in washes, or by different tints laid over each other, the colours are entirely dotted, stippled, or hatched upon the surface; though sometimes only the face and other flesh parts are so executed, as requiring greater finish and delicacy, while the drapery and background are either partially or wholly executed according to the usual mode of water-colour drawing. The material employed for painting upon is generally ivory (the surface of which is first prepared for receiving the colours), or vellum; sometimes Bristol-board, or other drawing-paper of that sort. Ivory however is preferred, as not only more durable, but bearing out the colours with greater brilliancy.

MINIM, in Music, a character or note formed of a round open head, and a stem descending or ascending from its right side—



When first introduced, the minim was the shortest note in music, as its name (from *minimus*, the least) indicates. It is half as long in duration as the semibreve, and double that of the crochet.

MINIMS, or MI'NIMI, a religious order who improved on the humility of the Friars Minors, by calling themselves *Minimi*, or the Least, They were instituted about 1440, by Saint Francis de Paulo, and confirmed in 1473 by Sixtus IV., and by Julius II. in 1507. They had convents in France and Spain.

MINING. The use of the metals, and consequently some process for the extraction and separation of them, may be traced to the most remote antiquity. Besides scattered notices in the Bible, profane history shows that mining was known to the earliest nations of antiquity. Gold and silver were abundant; an alloy of copper and tin formed the armour and weapons of the Greeks, although iron was not unknown among them, and of this metal the Roman weapons were formed. It

appears from Strabo (175, Casaub.) that the Phœnicians used to trade to the Cassiterides (probably the Scilly Islands or Cornwall) for tin. Herodotus (vi. 46, 47) observes that a mountain in the island of Thasos was completely burrowed by the Phœnicians in their search for the precious metals. The silver mines of Laurium in Attica were worked by the Athenians as early as the beginning of the fourth century B.C. Under the Romans the quicksilver-mines of Almaden in Spain were extensively worked.

Mines were worked in Britain by the Romans; but during the Saxon period they were much neglected; and subsequently to this period they were chiefly worked by Jews. In the reign of Elizabeth the art of mining had fallen into so much decay that an importation of foreign skill was found necessary to revive them; and the Germans, long and justly celebrated as skilful miners, received every encouragement to settle in this country and turn their attention to them. In the 17th century the use of gunpowder in mines was introduced; and early in the next century the rich copper mines of Cornwall were first worked.

The invention of the steam-engine was early rendered applicable to mining in this country, and contributed to the present perfect state of the art. After the invention by Savery and Newcomen, the steam engine became a most useful auxiliary in the hands of the miner; and the improvements of Watt were still more beneficial. The Cornish steam engines are now among the most powerful in the world. The use of iron pumps instead of wooden in the shafts, and the laying down of tramroads in the galleries of a mine, were two other great improvements.

Besides numberless improvements in the internal economy and management of mines, great changes have been made in the mechanical treatment of the ores after they have been extracted. The processes used for this purpose are technically termed 'washing' and 'dressing;' and several improved machines have been introduced in these processes.

The history of coal-mining is in great measure distinct from that which relates to the extraction of the metals. The introduction of gunpowder, the invention of the steam-engine, and the improved manufacture of iron, have formed however epochs of common importance to both, having greatly contributed to the present extended scale upon which all our mines are worked.

Of the various classes into which mineral deposits may be divided, it will be sufficient for our present purpose to notice four only, *veins*, *beds*, *masses*, and *fragmentary deposits*. *Veins* are generally long, narrow, and irregular fissures, traversing the rocky crust of the globe, which they penetrate to an unknown depth, and at a high angle of inclination. They are for the most part filled with sparry and stony substances called the 'veinstone,' or the 'gangue' of the vein, but contain here and there irregular masses or 'bunches' of the metallic ores, often of immense size and value, and which it is the principal business of the miner to discover and extract. Most of the metals are of common occurrence in veins. *Beds* are layers of mineral substances interposed between the strata of solid rock, which, except in their containing valuable matter, they very much resemble. Several of the metals, especially lead, are occasionally found in beds; coal, clay-ironstone, and rock-salt, exclusively so. *Masses* or *Pipe-Veins*, are irregular branching cavities descending either vertically or obliquely into the rock, and filled up with metalliferous matter. They usually contain copper, lead, or oxides of iron. *Fragmentary Deposits* occur associated with many of the loose superficial beds of sand and gravel which occur in the valleys of mineral districts, consisting of the detritus of the neighbouring mountains, which has been washed down from thence at remote geological epochs. Tin and gold are the chief metals found in this form.

The above-mentioned deposits are not found promiscuously distributed throughout all rocks or soils; on the contrary, there are certain rocks to which they may be considered as in great measure peculiar. Thus tin, copper, gold, silver, and certain deposits of iron, are most abundant in the class of rocks usually termed primary; while lead, zinc, mercury, and the earthy ores of iron, are most abundant in the older secondary rocks, which also contain our principal deposits of rock-salt. Veins are of most common occurrence in igneous and primary or metamorphic rocks, while beds are more prevalent in secondary formations.

With the exception of gold, most metals are found in the state of *Ores*, that is, chemically combined with certain mineralizing substances. The most important of these mineralizing bodies are oxygen and sulphur; the next in rank are chlorine, and the sulphuric, carbonic, and phosphoric acids. These elements require to be separated by the processes of metallurgy; but there are also other mechanical impurities scarcely less important, which require to be partially separated in the mine, and which therefore fall entirely within the province of the miner. It frequently happens too that ores of a worthless character are mixed up with the more valuable ones; thus copper and lead are very generally accompanied by iron pyrites and blende, both of which must be regarded as impurities, and therefore separated as far as possible previous to any process in the furnace.

Mineral veins or beds are seldom visible at the surface of the ground, being generally concealed by the soil. As the deposits usually present no trace of their existence at the surface, certain general indications must be had recourse to for their discovery. The most general of these indications are furnished by geology, which teaches us that certain metals are most abundantly found in certain rocks; and further points out that they do not occupy any position indiscriminately in those rocks, but are almost exclusively found near their junction with other rocks of a different character. In addition to such rules, another indication is afforded by finding pebbles or fragments of ore on or near the surface, generally either in the beds of streams, or mixed up with superficial detritus. A practical test is obtained by opening trenches in

the alluvial soil deep enough to expose the solid rocks; and another method is, by excavating a nearly horizontal passage termed a 'level,' 'drift,' or 'adit,' from the bottom of the nearest valley, and carrying it through the solid rock. Discoveries are sometimes made also by driving on the course of veins which occur in cliffs or are exposed in the sides of brooks.

When a new vein or mineral deposit has been by any process discovered, the most usual step, after obtaining the consent of the proprietor, is the formation of a company; for companies are generally found to work mines better than individuals. The company agree with the proprietor as to the extent of ground within which operations may be carried on, the proportion of the gross mineral produce or its equivalent in money which the owner is to receive free of all expense in raising and making it marketable, and other matters.

These preliminaries being disposed of, the vein or bed is commenced to be worked. The usual system is, to dig down from the surface until the vein or bed is reached. A spot is selected as the site of a shaft, which is frequently sunk in an inclined direction upon the course of the vein, or if intended to be perpendicular, it is commenced upon that side towards which the vein inclines or underlies, and at such a distance from its 'back' or outcrop, as to come down upon it a given depth, say 10, 20, or 30 fathoms.

On cutting the vein, the shaft is for a time suspended, and two horizontal passages, often termed 'galleries,' but by the miner 'levels,' are excavated or 'driven' upon the vein in both directions. These passages are usually about six feet in height and three or four in breadth, and rather smaller above than below. They are the principal means of exploring the contents of veins. If the shaft is deep, 'cross-cuts' and other levels are made at different heights, so as to explore the vein at different parts. After cutting the vein, there are two modes of proceeding—continuing the shaft perpendicularly through the vein, or obliquely upon the vein: the choice between these two plans depends on a number of practical circumstances. Supposing the shaft to proceed perpendicularly after cutting the vein, on reaching the depth of ten fathoms or thereabouts below the point of intersection another cross-cut will be driven to it. In this manner the shaft proceeds indefinitely, cross-cuts being driven at every ten fathoms or whatever distance is most convenient, and levels extended from each upon the course of the vein, the nature and value of which are thus thoroughly explored. The mining operations are soon affected by the impurity of the air. It is chiefly in the ends of the levels that the evil of imperfect ventilation begins to be felt, the air here gradually becoming close and unfit for respiration, as the levels dvance further from the shaft, especially when from the hardness of the ground frequent blasting is necessary. As soon as this is found to be the case, a remedy of a very simple nature is applied, which consists in sinking a small pit, termed a 'winze,' upon the vein, from the upper level to the extremity of the one below it.

This communication having been effected, the two levels become perfectly ventilated, each having a double communication with the atmosphere by which both an ascending and descending current is produced. The winzes are generally made at intervals of 20 or 30 fathoms apart, and from each level to those above and below it: they serve not only for ventilating the galleries, but also assist the exploring and working of the vein.

Should the vein be rich, the various operations may proceed indefinitely. The shaft will continue to be sunk, cross-cuts driven to the vein at every ten fathoms or thereabouts, levels extended in both directions from them, and the ground between them subdivided by winzes. The excavations will now have assumed a regular form, and become what is properly termed a *mine*. In mining operations, where the vein is not very hard, the ore may be broken down with the 'pick' only, but it is generally necessary to blast it with powder, by which process large quantities are detached from the vein by every shot. The ore having been detached is carried in tram-waggons to the shaft, and thence raised to the surface.

When the levels have been extended to a considerable distance from the shaft, the ventilation will again become defective, notwithstanding their communication by winzes. The expense of the transport of ore and masses of rock and rubbish to the shaft also becomes considerable; and if the prospects of the mine continue such as to warrant the expense, a new shaft must now be sunk on one or both sides of the former. This new shaft will be so placed as to intersect the vein much deeper than the former, and this point will be so arranged as to correspond either with one of the deepest levels, or some proposed level deeper still. By accurate measurements, mining engineers are able to work a second shaft from many different depths at one time. At the Consolidated Mines in Cornwall, a perpendicular shaft, 204 fathoms in depth, was worked from fifteen different points at once.

As the working of a mine proceeds, the increase of shafts and levels tends to obliterate, in a great degree, the uniformity and simplicity of operations which were at first apparent. The shafts in some of the older and deeper mines are very numerous. Some are used for draining, and some for drawing up the ore and rubbish. Coal-shafts are generally circular, and seven or eight feet in diameter; but mine-shafts are usually rectangular, averaging about eight feet by six.

As veins are generally found to run nearly parallel, and often at no great distance from each other, and as the neighbourhood of a productive vein is a favourable indication of the contents of others in its vicinity, transverse levels or 'cross-cuts' are frequently driven from mines at various depths, with a view to discover side-veins or to make trial of branches which diverge from the main lode. Metalliferous veins are often traversed by other veins crossing them at nearly right angles, which seldom contain ore, except perhaps near the points of intersection: they are termed 'cross-courses,' or 'cross-veins.'

Where a vein has been worked by driving a

level towards it from a valley or other convenient point on the surface, the drainage to the point of intersection is, of course, complete; and hence in mountainous countries, where deep ravines occur, levels may be brought in one below another, so as to prove the veins and unwater the mines to a considerable depth, almost superseding the use of machinery for this purpose. Levels thus opening to the surface, and serving for drainage, are termed 'day-levels' or 'adits,' and few of such mines are without one. In cases where mines have been opened by sinking down from the surface, which is the most common method, an adit is generally commenced from the bottom of some neighbouring valley, which is driven towards the vein with a slight inclination, so that the water may readily flow through it. Such adits are sometimes several miles in length.

In working mineral veins in distinctly stratified countries, this geological feature has a great influence on the arrangement of the subterranean works, as it impresses a peculiar character upon the contents of the veins, the metalliferous portions of which are in great measure confined to certain strata, while the intervening parts are poor and unproductive. Thus, instead of exploring the whole mass of the vein, as in the former case, it is only necessary to lay open those limited zones which are embosomed in the strata most favourable to enrichment, and to which therefore the workings are chiefly confined. In the lead districts, for example, a point is selected in some valley or ravine where the edges of the strata are exposed to view, and from thence a level is commenced, if practicable, upon the vein itself, the progress of which effectually explores its produce, and admits of a convenient extraction of the ore. Should the vein itself not appear in any spot from which it can be directly driven upon, the level is driven as a cross-cut till it is reached. From the main level, interior levels, winzes, and short cuts may be made to reach other beds of the ore. When such a level has been driven a considerable distance from its mouth or entrance, a shaft will be required, which is usually sunk from the surface so as to come down upon it near the end; and by this shaft and other excavations, the works of the mine may be indefinitely extended.

The tools and processes employed by the miner in the excavation of the rock or the vein are simple. As his work is chiefly of two kinds, simply *excavating* the ground when soft, and *blasting* it when hard, his tools are suited to each process, the 'pick' and 'gad' being used for the former; the 'borer' or 'jumper,' and the hammer used to propel it, for the latter, with several minor accessories for firing the shots, when the hole has been completed to its proper depth. The *pick* resembles a common pickaxe, but is smaller and more convenient, the iron head being sharp and pointed at one end, and very short and hammer-shaped at the other. The wedge or 'gad' is sometimes used in conjunction with the pick; it is made of wrought iron, and often with curved sides. The 'borer' or 'jumper' is an iron rod or circular bar, usually about two feet in length, steeled, and formed into a flat sharp edge at the end; it is driven into the rock by one man with a heavy hammer, while the other continually turns it round so as to expose the cutting edge to fresh surfaces of the rock. The pulverised matter is drawn out from time to time by a tool called a 'scraper;' and in the hole so formed are placed the powder and fusee for blasting.

The drainage of a mine is one of the earliest things which it becomes necessary to provide for, as mineral veins are generally more open and porous than the surrounding rock, and thus form natural reservoirs into which the surface water collects. When penetrated by the workings of a mine, this natural drainage is rendered still more complete, and water pours abundantly into the excavations. Where there is no adit, and where the mine is not deep, it is often drained by a *whim* or *gin*. This consists of an upright shaft carrying a large cylindrical drum, and turned round by a long lever to which horses are attached. A rope is coiled round the exterior of the whim, with both ends at liberty, so that while one end is winding up the other is unwinding, and both pass over a pulley placed above the shaft, having large iron buckets or kibbles attached to them, which by this arrangement are kept alternately ascending and descending, one kibble being loaded at the bottom while the other is emptied at the surface.

When the influx of water in a mine becomes at all considerable, recourse must be had to the power either of a water-wheel or a steam-engine to discharge it to the surface. If a water-wheel is used instead of horse-power, pumps are in that case fixed in the shaft, proportioned in size to the quantity of water to be drawn, 10 or 12 inches in diameter being a very common size, where there is only a moderate influx. The pumps used in mines do not act like common household pumps; they are arranged in 'lifts' or columns, of considerable height, often indeed from 20 to 30 fathoms, the water being discharged into cisterns placed at the foot of each. The pumps are now commonly made of iron. The whole column of pumps in a shaft is commonly worked by a single pump-rod, which goes down the middle of it and communicates with each column by a rod attached to its side. The steam-engine has long been the great auxiliary of the English miner, both for drawing up the minerals and for discharging the water.

The mode of support used in mines is of three kinds—by leaving pillars of the vein, for which purpose the poorer masses are of course selected; by timbering; and by walling either with brick or stone. Timbering is a very common and convenient plan, and consists of timber frame-work and boards. Shafts and levels are sometimes also supported by walling.

The ventilation of mines is most generally and most effectually accomplished rather by a judicious arrangement of the works and frequent communication with the surface than by mechanical means, although it sometimes becomes necessary to resort to the latter. In coal-mines the ventilation is generally effected by two shafts, one of which is

called the 'downcast shaft,' and the other the 'upcast shaft,' the latter of which has a large furnace continually burning near the bottom of it. The air being rarefied at this point, an ascending current is formed, which passes upwards to the surface through the upcast shaft with considerable velocity, causing a descending current to pass through the downcast shaft to supply its place.

The ore raised to the surface is enormous in some mines. At the Consolidated Mines in Cornwall it amounts to 200 tons a day, of which three-fourths is earth or rubbish. To remove this rubbish is the object of *dressing*, for which purpose the lumps are taken to the 'dressing floors,' near the mouths of the principal shafts and levels, and are there broken with hammers. The ore is then picked out by boys and women, and further subjected to various processes of crushing, stamping, and washing. When the metallic portions are as far separated as it is possible for them to be by these processes, they are roasted in furnaces, to drive off the oxygen and all other chemical substances that may be combined with them.

MINING, COAL. The nature and distribution of the carboniferous deposits are described in the article COAL-FIELDS. The thickness of workable beds of coal may be said generally to vary from three or four to eight or nine feet, although sometimes, when several seams come together without any intervening layers of rock, they may expand to twenty or thirty feet, of which we have an example in the 'ten-yard coal' of Staffordshire. In every coal-field there are many seams of coal at greater or less intervals, one below another, of which as many as three or four are frequently worked in the same mine.

When the position of the beds of coal has been discovered, the first process is to sink a perpendicular shaft from the surface so as to intersect the various strata containing the coal, and of course as many of the beds of coal as are considered to be worth working. The upper portion, as far down as the solid rock, is either bricked or walled, and where the ground is weak this casing may be continued throughout. On reaching the first workable seam of coal, the sinking of the pit is for a time suspended, and a broad straight passage termed a 'bord' or 'gate' is driven from it upon the seam of coal in opposite directions. The breadth of this passage is usually twelve or fourteen feet, and it is formed the whole height of the seam of coal, so as to expose the stratum above, which is called the 'roof,' and the one below, which is termed the 'thill,' and its direction is always arranged so as to follow the cleavage of the coal which forms its sides, which thus presents a clean uniform surface. When the principal bord has proceeded some distance on both sides of the pit, narrow passages, termed 'headways,' are driven from it at regular intervals, and exactly at right angles; and when these have proceeded eight or ten yards, they are made to communicate with another bord, which is opened parallel to the first and on each side of it. Thus the operations continue, until the mine resembles a town of streets rectangularly arranged. The water encountered in the above operations is drawn to the surface by a steam-engine erected at the top of the shaft, which is so arranged as also to raise the coal and rubbish, for which purpose either 'corves' or baskets are commonly employed. In small coal mines the ventilation is managed by separating a portion of the shaft from the larger part by an air-tight boarding, which is carried down to the bottom; but in large coal-mines another shaft is sunk at some distance from the first, and when the communication between them has been effected, the one being made downcast and the other upcast, the air is made to pass through the whole of the passages.

While the workings on the first seam of coal are thus going on, the shaft may be sunk to a second or third seam, where similar operations will be commenced, small underground pits or 'staples' being sunk at intervals from the workings on the upper seam to those on the seam below, by which ventilation will be promoted.

The mode in which the pitman proceeds in excavating the coal is by cutting a narrow fissure in the seam on each side of the bord with his pick-axe, and undermining the coal between, and then cutting into and forcing down the isolated portion of coal, or, where the seam is thick, by detaching the great cubical mass thus prepared by blasting, two or three shots being sometimes simultaneously fired at the top of the seam. From 60 to 80 or 100 tons of coal may thus be brought down at once, when it is put into corves, drawn along a tram-road to the shaft, and thence raised by a steam-engine to the surface, where it is often passed over gratings or 'screens' in order to separate the small pulverised coal from the larger masses.

In mines which are not endangered by explosive gases or 'fire-damp,' the coal-miner or 'pitman' is guided in his operations by the usual subterranean light—a small candle stuck into a piece of moist clay; but where the fire-damp is apprehended the safety-lamp is used. [LAMP, SAFETY.]

MINIUM. [LEAD.]

MINNESINGERS. [GERMANY, vi. 640.]

MINNOW. [LEUCISCUS.]

MINOR, MINORITY. A person is a minor, according to English law, when he is under twenty-one years of age. The term applies either to a male or female.

The term is derived from the Roman law, in which persons under twenty-five years of age (minores viginti quinque annis or annorum) were, to a certain extent, under the care of a curator.

MINOR (Latin), *Less*, or *Lesser*, is a term used to distinguish the mode or key that takes a minor 3rd. It is also applied to all the diatonic intervals, but chiefly to the 3rd. The minor 3rd comprises a tone and a semitone—A, C: the major 3rd is composed of two whole tones—C, E.

MINORCA. [BALEARIC ISLANDS; SPAIN.]

MINOS, the lawgiver of Crete. The concurrent testimony of Thucydides and Aristotle shows it to have been the general belief in their times that Minos was the first among the Greeks who possessed any amount of naval power. According to Aristotle, he conquered and colonised several

islands, and at last perished in an expedition against Sicily.

Some post-Homeric authorities make Minos a judge in Hades, in company with Æacus, Rhadamanthus being chief judge. Minos is a son of Jupiter; this being the usual method taken by the mythographers to express a person so ancient that they could put him on a level with no mere mortal; and from Jupiter, as his father, he learns those laws which he afterwards delivers to men.

MINSK, a government of European Russia, formed out of part of Lithuania, and lying between 51° 12′ and 55° 50′ N. lat., 25° 18′ and 30° 50′ E. long., is bounded N. by Witepsk, E. by Mohilev, S. by Tschernigov, Kiev, and Wolhynia, W. by Grodno and Wilna. Its area is 34,330 square miles, and the population in 1846 was 1,046,400. The face of the country presents two vast plains, separated by the irregular ridge of highlands that forms part of the watershed between the Black Sea and the Baltic, and broken here and there by a hill or by the high banks of the rivers. The northern slope is drained by the Desna, a feeder of the Düna (which forms the north-eastern boundary), and by the Niemen and its feeder the Vilia, both of which rise in this government. By far the greater portion of the government lies on the southern slope, the eastern portion of which is drained by the Berezina and its feeders; while the southern and south-western districts are drained by the Pripet and its numerous tributaries. The Dnieper runs along the eastern boundary from the point where it is joined by the Berezina nearly to its junction with the Pripet. In the north and east there are large forests, and on the south and south-west extensive marshes. The soil in the north is dry, and in some parts extremely fertile; in the south it is generally wet and marshy, but here also large tracts are very fertile. There is a good deal of heath and waste land all through the province.

The cold in winter is severe; the summer is hot and dry; night frosts occur in September, and winter begins at the end of October. On the whole the climate is healthy. The disease called *Plica Polonica* is common.

Agriculture is the chief occupation of the inhabitants, but it is in a very backward state. The grain generally cultivated is rye, of which a good deal is exported. The peasants grow also some barley and oats, and great landowners grow wheat. Other important products are flax and hemp. The extensive forests supply good timber, and yield likewise much tar and potash. All kinds of game abound in the forests. The horses are of the Polish breed, very spirited and hardy, but neither handsome nor large. Some of the nobles have studs of a superior breed. The urus, or aurochs, is sometimes met with in the forests. Sheep are numerous in the northern part. Goats, swine, and bees are reared in great numbers. Cochineal is collected in the south, and manna is found in the fields and meadows. The minerals are lime, marl, and building-stone, but there is no metal except bog-iron. The manufactures are unimportant, with the exception of brandy for home consumption.

Minsk, the chief town, situated in 53° 40′ N. lat., 27° 40′ E. long., on the Swistocz, a feeder of the Berezina, is irregularly built, with narrow crooked streets. It has a fine cathedral, a gymnasium, a Greek church, a theatre, and is the seat of a Greek archbishop and Roman Catholic bishop, as well as of the government of the province. There is some trade, and a much frequented fair. The population is about 22,000.

The other towns are—*Bobrouisk*, a fortress on the Berezina, with 4700 inhabitants; *Sluzk*, with 5000 inhabitants; *Dawidow*, on the Horyn, with 3500 inhabitants; *Pinsk*, which is surrounded with immense marshes, and has considerable manufactories of Russia leather, with 4500 inhabitants; and *Borissow*, on the Berezina, population, 3000.

MINSTREL, from the French *Menestral*, and that, in all probability, from *Ministrellus*, a diminutive of the Latin *Minister*, is a term applied to a class of persons who were to administer by their skill to the amusement of their patrons. 'The minstrels,' observes Percy, 'were an order of men in the middle ages who subsisted by the arts of poetry and music, and sang to the harp verses composed by themselves or others.' They seem to have been the genuine successors of the ancient bards. They were held in great honour in the days of chivalry; but their popularity gradually declined, and before Elizabeth closed her reign, their degradation was completed. By a statute in her 39th year, minstrels, together with jugglers, bear-wards, fencers, common players of interludes, tinkers, and pedlars, were included among rogues, vagabonds, and sturdy beggars, and adjudged to be punished accordingly. This act put an end to the genuine old minstrelsy as a profession; and the modern definition of minstrel is no more than 'a musician, a player upon some instrument.'

MINT. The place where money is coined, from the Anglo-Saxon 'mynet,' and that in all probability from the Latin *moneta*. It is a part of the royal prerogative to coin money.

The following is the establishment of which the English Mint at present consists:—

1. A Master and Worker. The salary is 2000*l.* a year.

2. The principal officers, forming a Board, viz.:—The Deputy Master, Comptroller, King's Assay Master, King's Clerk, and the Superintendent of Machinery and Dies.

3. Officers in the service, viz.:—The Master Assayer, Probationer Assayer, Weigher and Teller, Surveyor of Meltings, Surveyor of Money Presses, Chief Engraver, Second Engraver, Medallist, and Clerk Assistant and Deputy Master.

A comparative statement of the salaries and allowances, contingent expenses, and rates of coinage, between the establishments of the French and English mints in 1836 will be found p. 87–89 of the Appendix to the 'Report from the Select Committee of the House of Commons on the Royal Mint,' ordered to be printed 30th June 1837.

This Appendix contains other papers relating to the French mint, the mint of the United States of North America, and the Dutch mint.

Burke, in his speech on economical reform in 1780, proposed that the Mint should be abolished as a public establishment, and that the Bank of England should take charge of the business of coining. 'Tho Mint,' he said, 'is a manufacture, and it is nothing else; and it ought to be undertaken upon the principles of a manufacture; that is, for the best and cheapest execution, by a contract upon proper securities and under proper regulations.'

MINU'CIUS, FELIX, a Latin Christian writer of the third century, was a native of Africa, who came to live at Rome, where he exercised the profession of advocate. We have a work by him, entitled 'Octavius,' which is a dialogue between a Christian called Octavius and a heathen called Cæcilius, concerning the merits of the two religions which were then striving for supremacy. The dialogue of 'Octavius' has gone through many editions, among which those by James Gronovius, Leyden, 1709, and by Davis, Cambridge, 1712, deserve notice.

MINUET (*Menuet*, Fr.), a graceful slow dance, introduced into England from France in the 18th century. It consists of two strains or parts, of eight bars each, in three-crotchet time, and both are repeated. As an exclusively musical movement, in symphonies, quartets, &c., each strain of the minuet generally comprises sixteen bars, both strains being repeated; and it is followed by a second, called the trio; after which the minuet is played once more, straight through.

MINUTE (*minutum, portio minuta*). [Angle; Horology.]

MIRABAUD, JEAN BAPTISTE DE, born at Paris, in 1675, first embraced the military profession. In 1724 he published a French translation of Tasso's 'Jerusalem,' and was afterwards a member of the French Academy, of which he became secretary in 1742. He died at Paris in 1760. Besides the above-mentioned translation, and a very inferior one of Ariosto's poem, he wrote—1, 'Le Monde, son Origine et son Antiquité.' 2, 'Opinions des Anciens sur les Juifs.' 3, 'Sentimens des Philosophes sur la Nature de l'Ame,' and other minor works.

MIRABEAU, HONORE' GABRIEL DE RIQUETTI, COMTE DE, was born at Bignon, near Némours, in 1749. He was the son of the Marquis de Mirabeau, a man of some literary note, the author of 'L'Ami des Hommes,' and other works, and one of the leaders of the school of the 'Économistes.' Young Mirabeau was fond of pleasure, of love intrigues, and of spending money, and his father knew no better means of checking his irregularities than by obtaining 'lettres de cachet' against his son, and confining him in several state prisons in succession. While confined in the castle of Joux, in the Jura Mountains, he seduced and escaped to Holland with a married woman, to whom he afterwards addressed several licentious works under the name of Sophie. For this offence the parliament of Dijon condemned him to death *par contumace*.

In Holland Mirabeau began to work for the booksellers as a means of subsistence. While thus employed, he was siezed by the agents of the French police, and was shut up in the dungeon of Vincennes near Paris, where he remained more than three years. During his confinement he went through a course of general reading, and wrote several works, most of which were of the amorous kind, and some of them obscene. He also carried on a correspondence with his mistress Sophie, which was published after his death.

On his release in 1780 he wrote his work 'On the Lettres de Cachet, and on State Prisons,' which made a deep impression on the public. About 1784 he visited London. From England he wrote his 'Letters to Chamfort,' in which he praised the institutions of the country. In 1786, he was employed by the French minister Calonne, on a secret mission to Berlin, where he spent about eight months. On his return to France he wrote his work 'De la Monarchie Prussienne,' and also an 'Histoire Secrète de la Cour de Berlin,' which the French government caused to be burnt by the hand of the public executioner.

The convocation of the States-General, in 1789, opened to Mirabeau a new and brilliant career. He was returned for the towns both of Aix and Marseille. His course during the proceedings of that assembly was marked by wisdom and moderation. It is Mirabeau's peculiar boast, that throughout his political career his passions and party feelings never got the better of his judgment.

He was opposed to the Commons giving to themselves the title of 'National Assembly,' but the great step once taken by the Commons, he was faithful to them, and boldly supported their rights. Mirabeau was acknowledged as the chief leader in the National Assembly, and continued to hold this supremacy for nearly two years, till the time of his death. Without belonging exactly to any party, he was courted or feared by all.

During the stormy period which followed the destruction of the Bastille, Mirabeau was constantly with the Assembly, day and night, at Versailles, supporting the firmness of the members, and insisting on the necessity of the king withdrawing the troops from the capital.

Mirabeau was one of the committee of five appointed to prepare the model of a declaration of the rights of man. But he did so with considerable reluctance, looking upon any such document as a puerile fiction. He also opposed the subsequent violent proceedings of the democratic party. His speech on the national bankruptcy was to him a complete triumph. In this speech he supported the minister Necker, to whom he was personally hostile, in his plan of a forced loan to make up the deficit in the revenue. Several members had proposed modifications, which Mirabeau thought would destroy the effect of the measure.

On the 5th and 6th of October, when the populace of Paris went to Versailles, insulted the royal family, and threatened their lives, a plot was attributed to the duke of Orleans, and Mirabeau was implicated in the supposed conspiracy; but the National Assembly declared that there was no ground of accusation against either. About November Mirabeau unexpectedly communicated to Dumont a plan to draw the king away from

Paris. He acknowledged to him that it had originated with the court party, and that he had intended to co-operate in the movement, in order to direct it in favour of liberty. Dumont did not regard it favourably, and a few days afterwards Mirabeau told him that the plan was given up, and the affair remained a secret.

During 1790 Mirabeau continued to hold the first rank as a leader of the National Assembly. In the important discussion on the right of peace and war, he declared, to the great dismay of the democrats, that the king ought to be invested with this prerogative, and supported his opinion by a logical and brilliant speech. He opposed the violent measures proposed against emigration; and on the question of the regency he told the assembly to judge for themselves, and not to heed the shouts out of doors.

By every means in his power, in short, did this extraordinary man, while crushing the old aristocracy with one hand, repress the fury of the democratic faction on the other.

In January, 1791, Mirabeau was named President of the National Assembly. Never had this office been so well filled. He displayed in it a new kind of talent. He introduced a degree of order and clearness in the proceedings, of the possibility of which no member had previously the least conception.

Mirabeau died April 2, 1791, of a short but violent disease, the result of his mode of living and of continual excitement. During his illness he suffered much, but endured his pain with calmness and resignation.

Mirabeau was a brilliant orator, and a fluent though not original writer. The great characteristic of his genius consisted in his political sagacity, his anticipation of events, and his knowledge of mankind. His ambition during the latter period of his life was centered in the idea of becoming prime minister of a constitutional monarchy. He left a natural son, who published Memoirs of his father, in 4 vols. 8vo., London, 1835. Besides the numerous works and pamphlets of Mirabeau which were printed in his lifetime, several collections have been published since his death:—'Collection Complete des Travaux de Mirabeau à l'Assemblée Nationale,' Paris, 1791; 'Œuvres Oratoires et Choisies de Mirabeau,' 6 vols. 8vo., Paris, 1820.

Mirabeau was tall, thick-set, and naturally robust, but very plain in his features; and yet, when he chose, his manner was extremely fascinating.

MIRAGE, generally called *Looming*, is an optical illusion occasioned by the refraction of light through contiguous masses of air of different density. The illusions of the mirage differ according to circumstances, but they may all be arranged under one or other of the three following classes—vertical reflection, horizontal or lateral reflection, and suspension.

In the vertical reflection the mirage presents the appearance of a sheet of water in which objects are reflected, and of course reversed as they would be in a lake. It is this kind which is observed in Egypt, and which so cruelly tantalised the parched throats of the French soldiers during the campaign of Napoleon in that country. After the soil has become heated by the presence of the sun, the prospect seems bounded by a general inundation. The villages beyond appear as islands in the midst of a great lake. Under each village its inverted image is seen as it would be if reflected from the surface of a sheet of water. On approaching, however, the deceptive inundation recedes, and the reflected image vanishes, to be succeeded by another as some more distant object comes in sight.

This kind of mirage is not peculiar to Egypt; it is known in Persia also, where it is called *Serab* or *Sir-ab* (miraculous water); and it is seen by those who cross the western deserts of India, where it is known by the name of *Tchittram* (picture). Biot has observed it over the sandy beach of Dunkirk, and it is not unfrequent along the coast of the department of Calvados.

In the horizontal or lateral reflections the mirage presents the reflected image sideways. Thus, on the 17th of September, 1818, Messrs. Jurine and Soret observed a lateral mirage on the lake of Geneva. A bark, about 8000 yards distant, was seen approaching Geneva by the left bank of the lake, and at the same moment there was seen above the water an image of the sails, which, in place of following the direction of the bark, receded from it, and seemed to approach Geneva by the right bank of the lake, the image sailing from east to west, while the bark was sailing from north to south. In like manner Dr. Vince, on the 6th August, 1806, at 7 P.M., saw the whole of Dover Castle brought over and placed on the Ramsgate side of a hill situated between the two places, and he adds, the image was so strong, that the hill itself could not be seen through it. The French coast is sometimes brought almost in contact with our own by the like illusion. This lateral mirage has also been observed in Egypt and India. And in particular situations both the vertical and lateral mirage may be observed together.

The phenomenon called suspension, which is the third kind of mirage, and is that to which the term looming is most strictly applied, is the picturing of an object immediately over it in the air, frequently without reversion of the image. Sometimes the objects are merely raised above the height at which, under ordinary circumstances, they would appear. Thus Sir R. K. Porter mentions a phenomenon of suspension or looming in the plains near Bagdad, in which the waters of the Tigris appeared considerably elevated above the level of the desert. The phenomenon of the looming is most generally observed at sea or near the shore. At Reggio the celebrated Fata Morgana is visible, which for many centuries astonished the vulgar and perplexed philosophers. [FATA MORGANA.] The image raised by suspension is sometimes reversed: the most remarkable instance of this is perhaps that mentioned by Captain Scoresby, who, in 1822, recognised his father's ship, the Fame, by its inverted image in the air, although the ship itself was below the horizon, and thirty miles off.

It frequently happens that the phenomenon of the vertical mirage is combined with that of suspension, so as to show in the air both a direct and an inverted image of the object, the latter being undermost.

All these phenomena and their various modifications depend on differences in the density of the lower strata of the air.

If the lower stratum of air have a less density than that of the air above, and the object be seen by direct vision in its proper place, a reversed image of the same just below it will also be seen, because the rays coming from it obliquely towards the ground are refracted from their direct course on entering the less dense inferior stratum of air, and, taking at first a direction inclining to the horizontal, are afterwards bent up so as to meet the eye of the observer, who thus sees the indirect image exactly as it would appear if reflected; and moreover as the rays from that part of the heavens which forms the back-ground to the object are refracted in the same manner, the sky is reversed as well as the object, and presents the appearance of a sheet of water.

If the lower stratum of air be denser than the strata above, and the object be seen by direct vision through the denser stratum, then the curve or trajectory, instead of being convex towards the earth, will be concave, and the reversed image will be seen as if suspended in the air above.

Double images, one inverted and the other erect, may also be explained by some rays of light from the top and bottom of an object describing curved lines in the air before they enter the eye of the spectator, while others, also describing curves, but higher in the atmosphere, do not cross one another.

All the phenomena known by the names of the *Enchanted Island*, *Cape Fly-away*, the *Flying Dutchman*, &c., are effects and modifications of the mirage.

These unusual refractions were known to the ancients, and are well described by them, though they seem not to have understood the rationale of the phenomena. (Quintius Curtius, vii. 5).

MIRANDA. [Castilla-la-Vieja; Tras-os-Montes.]

MIRANDA, SA DE, one of the earliest poets of Portugal, and one of the chief founders of Portuguese literature, was born of a noble family at Coimbra, about the year 1495. Greatly as the literature of his country is indebted to him (and he was the first to adopt the metres of Dante and Petrarch), few of his productions are of a class to interest the modern reader. A considerable number of his compositions are written in Spanish; and, as a dramatist, he not only imitated the dramatists of Italy, but laid his scenes in that country, and described Italian manners and characters. His 'Cartas,' or poetical epistles, are of far greater intrinsic value than any of his other productions. He died in 1558.

MIRANDA, FRANCISCO, the founder of the independence of Spanish America, was born about the middle of the last century, in the city of Caracas, of which province his grandfather had been governor. The French revolution drew him to Paris, where he became major-general to Dumouriez. He was accused of having caused the defeat of the left wing of the army at the battle of Neerwinde; but was acquitted by the revolutionary tribunal. He was however seized and condemned by the Directory on the 18th Fructidor, but escaped, and came as a refugee to England. He returned to Paris in 1803, whence he was banished, a second time, by Bonaparte. In 1806 he landed in Venezuela, in order to effect his country's independence. Though at first defeated, he maintained the cause from 1810 till the earthquake in 1812, with considerable success. The terror occasioned by that event paralysed his forces, and he was forced to surrender to the Spanish army. Unfortunately he incurred the suspicion of some of his own party, by whom he was accused of being a traitor and an ally of the British cabinet. He was arrested by Bolivar when about to leave the country, and delivered over to the Spanish general, Monteverde, upon certain terms, which the latter unceremoniously violated by sending his prisoner in chains to Spain. Miranda was lodged in the prison of the restored Inquisition at Cadiz till 1816, when death released him from his sufferings.

MIRANDE. [Gers.]

MIRANDOLA. [Modena.]

MIRECOURT. [Vosges.]

MIREPOIX. [Arie'ge.]

MIREVELT. [Mierevelt.]

MIRROR (from the French *miroir*), any polished surface which reflects light so as to form an image. [Optics.]

MISDEMEANOR. [Law, Criminal, vii. 881.]

MISENUM. [Naples.]

MISPRISION (from *mesprendre*, which means sometimes to deal improperly with, sometimes to treat with contempt), is a term used in English law in different senses.

Misprision of treason consists in a party's withholding his knowledge of a treason committed or about to be committed, or in omitting to give information respecting it within a reasonable time to some public authority. Misprision of treason is a misdemeanor, punishable by imprisonment for life and the forfeiture of the personal property of the offender absolutely, and of the rents and profits of his real property for life.

Misprision of felony is a similar concealment in respect of felonies, and it is punishable by fine and imprisonment. In some if not in all cases of felony, the party may be proceeded against for the minor offence, or misdemeanor, although a felony has actually been committed by him.

Misprision, by doing something which ought not to be done, is the commission of such misdemeanors as are construed to involve a contempt of the royal authority or prerogative. Maladministration in high offices of public trust, though indictable as a misprision, is commonly, on account of its importance, made the subject of parliamentary impeachment.

MISSAL (from the Latin *missa*), the book or ritual containing the several masses to be used in the Roman Catholic church on particular days or feasts.

The Roman missal was originally compiled by Pope Gelasius, and afterwards reduced into better order by Gregory the Great, who called it the Book of Sacraments. The 'Missale Romanum, ex decreto Concilii Tridentinii restitutum,' is that at present in use. Anciently, each diocese, and each order of Religious, where they chose, had their particular Missal, accommodated to the festivals of the province or order.

The Missals of the 13th, 14th, and 15th centuries, written previous to the discovery of printing, present us, in many instances, with the finest specimens of illumination now preserved in our libraries.

MISSELTOE, a parasitical plant found wild in this country (the *Viscum album* of botanists). The structure and economy of this plant offer many points of interest to the botanist. The seeds are mucilaginous, and, in fixing itself upon a branch, the embryo of the misseltoe curves its radicle down upon the bark, and then adheres firmly to it, and it is a twelvemonth before the plumula begins to extend. This may be to give the radicle time to pierce the bark and introduce itself below the liber, where it expands and acts the part of a root by attracting thence the fluids which are necessary for the support of the parasite.

The plant is not of any known use to man, and is of popular interest chiefly as having been connected with Druidical superstitions. The misseltoe of the Druids was exclusively that found upon the oak, and was possibly so much valued because of its rarity; for its appearance on that tree is now so rare that many persons have believed the Druids' misseltoe either to have been some other plant or to have had no real existence. But it has lately been found on more than one oak-tree in Herefordshire, and it is probable that it grew in the oak woods of Snowdon before the damp western parts of Britain were disforested.

MISSIONS. The 15th verse of the 16th chapter of Mark is the great scriptural authority for missions. In the sixth century (590–604) Pope Gregory the Great sent missionaries to Britain, to convert the people to the Christian faith. Similar means were adopted in other countries until about the close of the tenth century, when the Christian religion had become the prevailing faith throughout Europe. Other fields for missionary exertion were then sought. Attempts were made to propagate Christianity in Tartary and China; and the Portuguese, who visited Abyssinia about 1490, endeavoured to bring over the Christians of that country to the Roman Catholic faith.

With the earliest maritime discoveries of the Portuguese the desire for the conversion of heathen people was excited with renewed zeal, and may even be said to have been instrumental in stimulating the passion for maritime expeditions. About 1430 Pope Martin V. granted plenary indulgence to the Portuguese who conquered pagan and infidel countries. Columbus himself was strongly urged to discovery by the desire of propagating the Roman Catholic religion.

Modern missions may be said to have commenced at the same period with these discoveries, in which the popes took great interest. During the 16th century, not a fleet sailed for India or America without its missionaries; but the barbarous spirit in which conversion was too often enforced by the commanders of those expeditions, tended considerably to retard their progress. It was not until the stream of missionary enterprise was directed and regulated by different religious orders and distinct institutions, that any great success was attained. The establishment of the society of Jesuits in 1540 produced most important results. [JESUITS.] Besides maintaining missionaries of their own in every quarter of the globe, they succeeded in arousing the zeal of other religious orders—the Franciscans, Dominicans, &c.; and early in the 17th century training institutions for missionaries became general, especially in France and Italy.

The first Protestant mission seems to have been founded by the church of Geneva, which sent missionaries to America in 1556. In the following century the Dutch were very active in the cause, in Ceylon, Java, Formosa, and Amboyna; and the English were as zealously employed in America. The Danish and Moravian missions were commenced towards the close of the century, and lent very energetic assistance. The result of similar movements of the kind has been that Protestant missions have multiplied to a very great extent. English missions, attached both to the church and dissenting communities, are established in nearly every place where their exertions can be rendered available. They are supported principally by voluntary contributions. They publish periodical reports of their proceedings, which are easily obtainable. Their annual meetings are generally held in the month of May, in Exeter Hall, London. The accounts presented at those 'May Meetings,' and the large number of persons of influence and distinction by whom they are attended, sufficiently indicate the progress of the cause, and the importance attached to it by all classes of Christians.

MISSISSIPPI (or the 'Great Water,' as the term signifies in the native language), is one of the largest rivers on the globe, which drains with its numerous branches, a surface of about 1,100,000 square miles. Its basin extends from 29° to 50° N. lat., and from 77° to 111° W. long.

The sources of this river are two small lakes situated in 47° 10′ N. lat., and between 95° 30′ and 96° W. long. The western, called Lake Itasca, is about eight miles long; the eastern Usawa Lake, is hardly two miles in length. These lakes are estimated to be about 1500 feet above the level of the sea. From each of these lakes a small stream issues in a northern direction, which unite, after a circuitous course of 50 or 60 miles, in 47° 38′ N. lat. The united stream falls into Lake Travers, which is about 12 miles long from north to south, and six or seven broad, and is the most northern point attained by the river. Issuing from the eastern side of this lake, the river flows S.E. to Cass Lake. From Cass Lake it still runs in an I

direction to Little Winnipeg Lake, from which its S.E. course begins. Issuing from Lake Winnipeg, the Mississippi flows with great velocity, and forms several small falls. Nine miles above the place where the Mississippi is joined by its first great affluent, the St. Peter's River, which falls into it from the W., occur the largest cataracts in the river, called St. Anthony's Falls. The Mississippi, though considerably narrowed by the rocks, is about 640 yards wide at this point; the perpendicular height of the falls is 16 feet. There is a considerable rapid both above and below the falls, and goods must be carried over a long portage. The difference of level between the places of disembarking and reloading is 58 feet. For several miles farther down rapids occur. The Falls of St. Anthony may be considered as the point where the Mississippi terminates its upper course.

From the Falls of St. Anthony to Lake Pepin the river winds through a country of prairies, the surface of which is rather undulating than hilly. At Lake Pepin commence the bluffs, or wall-like high grounds, which generally run parallel to the course of the river, and at some distance from it. Lake Pepin, in most parts, nearly fills up the whole space between the bluffs, which rise about 450 feet above its level. This lake is about 21 miles long, and its breadth varies from one mile to three miles. At the Rock Island Rapids, which occur a short distance above the mouth of Rock River, the bed of the Mississippi is contracted to 800 or 1000 yards; and at the Des Moines Rapids, which are near the mouth of the Des Moines River, it is only 1000 yards wide. At Rock Island Rapids the river descends 44 feet in a distance of 15 miles; and at Des Moines Rapids 30 feet in 11 miles. In many places the river spreads out to the width of five or six miles, and appears to lose itself among numberless islands, between which it runs in narrow channels. At the mouth of the river Wisconsin the bluffs are 400 or 500 feet high; but near the river Illinois only from 100 to 150 feet high. These bluffs are intersected by numerous deep ravines and watercourses. Between the Falls of St. Anthony and the mouth of the river Missouri, the Mississippi receives no considerable affluent from the west, except the St. Peter's River; but from the east it is joined by the St. Croix, the Wisconsin, the Rock River, and the Illinois. At the mouth of the Missouri the middle course of the Mississippi terminates.

Below the mouth of the Missouri, the river flows with a comparatively gentle course, in one stream, rarely interrupted by islands. The only serious obstruction to navigation occurs about 30 miles above the mouth of the Ohio, where two bars of limestone, called the Big Chain and the Little Chain, extend across the bed of the river. In the low state of the river these bars have little water on them, which, added to the rapidity of the current over them, renders the ascent of vessels very difficult. The vale widens more and more as it extends southward. It consists of an alternation of high lands with an undulating surface, and of low bottoms partly covered with swamps.

The most northern of these bottoms, called the American Bottom, begins four miles above the mouth of the Missouri, on the eastern bank, and extends to the mouth of the River Kaskaskia, a distance of seventy miles in a straight line. It is several miles wide, and has a soil of astonishing fertility, consisting of comparatively recent deposits from the river. Opposite this bottom, on the west side of the Mississippi, the high lands approach the river, presenting abrupt declivities, and in many places perpendicular precipices from 100 to 200 feet high. These high lands continue along the right bank of the Mississippi somewhat farther than Cape Girardeau, north of which place they attain their greatest elevation, which is 350 feet. Between the mouth of the river Kaskaskia and the Ohio are also high lands of inferior elevation, but about thirty miles above the mouth of the Ohio, the banks begin to be low, and continue so to its very mouth. The soil consists of recent alluvium, and is covered with dense forests: the width is about 10 miles. This low alluvial tract continues south of the mouth of the Ohio for about 17 miles, where the river runs at the base of the Iron Banks, which rise nearly perpendicularly about 130 feet above the level of the river, and are annually wearing away by the action of the water, which sets strongly against them. From the Iron Banks southward, bluffs less than 200 feet high skirt the banks of the river as far south as 35° N. lat., with the exception of a bottom ground about 30 miles long, and from 3 to 4 miles wide, which lies between 36° and 36° 30′ N. lat.; it is a swamp covered with high trees, and hence called Wood Swamp. South of it some bluffs attain an elevation of 200 or 300 feet, especially the four hills called the Chickasaw Bluffs. The country opposite to this high bank, on the west side of the river, is low. It begins on the north, about 10 miles below Cape Girardeau, with the Tywapatia Bottom, a fine tract of wooded country, and extends to the mouth of the St. Francis River, a distance of more than 160 miles in a straight line. Its width is more than 50 miles, and its western side is skirted by bluffs of moderate elevation, which, for a considerable distance, run along the western banks of the Black River and White River, nearly parallel to the Mississippi. This extensive tract is traversed in all its length by the St. Francis River, which is joined not far from its source by an offset of the Mississippi, by which, during the time of the freshets, a great volume of water is poured towards the middle of the plain, so that the greater part of it is inundated, and a considerable extent is a swamp all the year round. This swampy tract, extending on both sides of the St. Francis River, is called the Great Swamp. The country is covered with a continuous forest.

On the south, this low region borders on another, which is not much more elevated, but is less subject to inundations. The whole tract extending from the mouth of the St. Francis River to 33° N. lat. is quite level, without any elevations, and does not form bluffs along the

banks of the Mississippi. It is covered with recent alluvium, and mostly wooded. Its width may be between 30 and 40 miles; and on the west it borders on a more elevated hilly region covered with pine-forests. Opposite to this region, on the left bank of the Mississippi, is an immense swamp, of which the Chocktaw Indians were in possession of the widest part. This swamp extends from opposite the south of the St. Francis River to that of the Yazoo, a distance of about 150 miles, with a width of about 50 miles in the middle, where it is widest, and an average breadth of about 30 miles.

South of the mouth of the river Yazoo, the bluffs on the eastern bank of the Mississippi reappear, and extend south of Baton Rouge (about 30° 30′ N. lat.). The bluffs rise rather steeply from 100 to 200 feet above the bed of the river. Opposite to this bluff region is another low and generally swampy tract, which is traversed by the river Tensas. It is from 20 to 30 miles wide, beginning north of 33° N. lat., and extending southward to the mouth of the Red River and the efflux of the Atchafalaya branch of the Mississippi, where it is connected with the extensive low regions of the delta which constitutes the most southern portion of the vale of the Mississippi. [Louisiana.]

The Mississippi falls into the Gulf of Mexico by six mouths, after a course of more than 3200 miles; but if we consider the Missouri as the principal river, the whole course is at least 4400 miles.

Rivers which drain the Basin of the Mississippi.—The rivers which fall into the Mississippi from the east drain a country which is cultivable to a great extent. The most northern on this side is the *St. Croix River*, which joins the Mississippi between the mouth of the St. Peter's River and Lake Pepin. It rises in Upper St. Croix Lake, and flows S., and about 40 miles from its source enters the Lower St. Croix Lake, which is 30 miles long, but of inconsiderable breadth. The river is navigable for about 20 miles above the lake. Its course exceeds 120 miles.

The river *Wisconsin*, or *Ouisconsin*, rises in the centre of the mountain region called the Wisconsin Hills, through which its course is in a general S. direction for about 180 miles. Where it approaches the sources of the Fox River of Green Bay, it turns gradually E., and its course in this direction also is estimated at 180 miles. When swollen it is navigable in the lower part of its course for boats of considerable burden.

Rock River rises near 44° N. lat., near the western shores of Lake Michigan, and runs S.S.W. and W. about 300 miles, falling into the Mississippi near 41° 30′ N. lat. It is only navigable for small boats.

The *Illinois* is described under Illinois.

The *Ohio*, the largest and most important of the eastern affluents of the Mississippi, is formed by the confluence of two rivers, the *Alleghany* and *Monongahela*. The Alleghany rises in several branches south of the eastern extremity of Lake Erie. The general direction of its course is S.W. and then S., and after a course of about 200 miles it unites with the Monongahela, the sources of which river are nearly 300 miles south of those of the Alleghany. The Monongahela rises in Virginia, in the Laurel Ridge of the Appalachian Mountains, and runs N. Its course may be about 200 miles. These two rivers, uniting at Pittsburg, form the Ohio, whose course from this place to its junction with the Mississippi, in a direct line, is 548 miles, but measured along its windings 948 miles. At Pittsburg its mean level is 850 feet above the tides of the Atlantic Ocean, and at its junction with the Mississippi about 320 feet. Except in high floods the current of the Ohio is gentle and nearly uniform. About 300 miles from its mouth, near the town of Louisville in Kentucky, are some rapids, where the river falls 22 feet in less than two miles. To avoid these rapids a canal has been made on the south side, called the Louisville and Portland Canal. About 15 miles from the mouth of the Ohio a limestone bar extends across the river, called the Grand Chain. This place is impassable for boats of considerable burden in the lowest state of the water. With the exception of these two places, the Ohio has sufficient water during a part of the year to float vessels of 300 tons burden as far as Cincinnati, and boats may ascend it to Pittsburg. The Ohio runs in a valley, inclosed on both sides by ranges of hills, called the River Mountains, which vary considerably in height, but are generally between 300 and 500 feet. The hills disappear a little above the confluence of the Ohio and the Green River. At this point a low country commences, which extends to the mouth of the Ohio, a distance of more than 150 miles: the river also increases in width and diminishes in velocity. The low country on its banks is thickly wooded, and its soil is a deep alluvium. The rivers which fall into the Ohio from the north, as the Big Beaver, the Muskingum, Sciota, Miami, and Wabash, are navigable in the greatest part of their course. The rivers which join the Ohio from the south, especially the Kenhawa, Great Sandy River, Kentucky, Green River, Cumberland River, and Tennessee, are navigable for boats, and many of them for steam-boats, to a great distance from their mouths during the boating season.

South of the mouth of the Ohio no considerable river joins the Mississippi from the east, except the *Yazoo*, which falls into it 5° of latitude farther south. Its course may amount to about 250 miles, and it is navigable for boats, in the spring season, for 50 miles from its mouth.

The rivers which join the Mississippi from the west have a much longer course, as most of them rise on the declivity or near the base of the Rocky Mountains. The most northern is the St. Peter's River. The Mississippi is afterwards joined successively by the Upper Iowa, Turkey River, Lower Iowa, and Des Moines River. [Iowa.]

The *Missouri* is the largest of the affluents of the Mississippi; and as the sources of the Ohio drain the most north-eastern corner of the basin of the Mississippi, so those of the Missouri drain its most north-western angle. It rises in two branches in which all the waters descending from the

eastern declivity of the Rocky Mountains between 42° and 49° N. lat. unite. The northern, called the Missouri, rises near 44° N. lat., and runs N. to near 47°, partly within the range of the Rocky Mountains and partly along its base, a distance of more than 300 miles; it then turns E., and, after a course of 400 miles, meets the other branch, the *Yellow Stone River*, which rises between 43° and 44° N. lat.; but its southern affluents rise as far south as 42° N. lat. Its course is first N.N.E. and then E., approaching gradually to the Missouri, which it joins after a course of 800 miles. The course of these two branches may be compared with the Rhine in length, and probably also in volume of water, as the Yellow Stone River is 860 yards wide near the junction. But the Missouri loses much of this water during its long course through a sandy desert; and though it is joined in the lower part of its course by some large rivers, it is stated that the volume of water which it pours into the Mississippi is not greater than what it contains immediately after its junction with the Yellow Stone River. After the junction of its upper branches the Missouri continues to flow E. for 200 miles, declining however a little to the S., until it reaches the Mandan Villages (near 100° W. long.), where it is deflected by the Coteau des Prairies to a southern course for above 300 miles, until it unites with the White River. In this course of 500 miles it is joined by several affluents from the west. From its junction with the White River it again flows E. for 200 miles, and then E.S.E. for 300 miles, to the mouth of the Kansas, which is its largest tributary, with the exception of the Platte, which joins it about 180 miles farther up. After the junction with the Kansas it runs still 250 miles, turning a little to the S. of E., and joins the Mississippi near Belle Fontaine, after a course which probably is not less than 3000 miles. The Missouri is a very rapid river in the whole of its course, but it contains no falls except in the vicinity of the Rocky Mountains, where it flows over several ledges of rock for above 18 miles. In the lower part of the course its vale is wide and very fertile, and it is generally covered with a deep and heavy growth of timber and underwood for about 350 miles from its mouth. There are however prairies of considerable extent, even in this part of its course.

Below the mouth of the Missouri the Mississippi is joined by no considerable river from the west for about 400 miles, until south of 35° N. lat. it receives the *St. Francis River*. The *White River* follows next. The *Arkansas* joins the Mississippi a little farther south. [ARKANSAS.] The last considerable river which falls into the Mississippi from the west is the *Red River*, which flows along the northern boundary of Texas, and has a course of 1500 miles.

MISSISSIPPI, one of the United States of North America, is situated between 30° 10′ and 35° N. lat., and 88° and 91° 40′ W. long. It is bounded N. by Tennessee, E. by Alabama, S. by the Gulf of Mexico and Louisiana, and W. by Louisiana and Arkansas. Its length N. to S. is 340 miles, and its average breadth about 150 miles. The area is 45,760 square miles. The population in 1840 was 375,651, of whom 195,211 were slaves.

Surface and Soil.—The shores near the mouths of the river Pascagoula and Pearl River are low and sandy, and in many places interrupted by swamps. In the space between the two rivers there is a higher tract of land, beginning two miles E. from St. Louis Bay, and stretching to Biloxi Bay, a distance of nearly 24 miles. The country which stretches northward from this coast to 31° N. lat. is low, and the soil is uniformly sandy and covered with extensive pine-forests. The country between 31° and 32° N. lat. includes by far the best portion of the state. The tract contiguous to the river Mississippi consists of numerous hills, or bluffs, very irregularly scattered over the surface, and rising from 50 to 150 feet above the narrow low tract which in some places lines the course of the river. This hilly tract appears to be the western continuation of the country farther east, which rises imperceptibly higher, and extends in wide plains. The bluff region continues northward to the mouth of the river Yazoo. The whole of the lands watered by the Yazoo are very fertile. The plains, which are covered with pine forests and furrowed by streams, extend somewhat farther north, where they begin to be intersected with prairies, which increase in number and extent as we proceed farther north, and occupy the greatest portion of the country lying north of 33° N. lat.

Rivers.—The Mississippi forms the western boundary of the State. The Yazoo is the largest affluent of the Mississippi, which has its whole course in the State. [MISSISSIPPI, River.] Several of the smaller affluents of the Mississippi also rise and terminate in this State. The most important are the Homochitto, and the Big Black River. The Homochitto runs about 70 miles, and is navigable to some distance from its mouth for small craft. The Big Black River flows S.W. about 160 miles, and is navigable about 70 miles from its mouth in the rainy season. The Pearl River rises in the centre of the State, and runs first S.W., and afterwards S.S.E., for about 250 miles. It falls by several branches into the Rigolets, or straits which unite Lake Pontchartrain with Lake Borgne. It is navigable for boats for 150 miles, but its entrance is shallow, having a depth of only about 5 feet. The Pascagoula, after a course of 250 miles, falls into the Gulf of Mexico, widening at its mouth into a bay.

Climate.—As this State rises from a low shore to 500 feet and upwards in its northern districts, a great difference of climate prevails in the different regions, especially as the northern districts are nearly 5° from the southern. Little however is accurately known respecting the more elevated parts. Along the southern coast frost is of rare occurrence in winter, and the heat of summer is tempered by the sea breeze from the Gulf of Mexico during this season.

Productions.—The principal objects of cultivation are cotton and Indian corn. In 1840 the cotton produced amounted to 193,401,577 lbs., the Indian corn to 13,167,237 bushels. Wheat,

rye, and oats do not thrive so well as in the northern states, and are only cultivated for home consumption. Plums, peaches, and figs are abundant.

Manufactures and Commerce.—The manufactures do not extend beyond the common mechanical arts. Though this State has a coast-line of about 80 miles, it has no harbour deep enough for schooners. The fertile tract along the Mississippi, which produces cotton and Indian corn in abundance, sends these articles down to New Orleans, whence it is supplied with those goods of foreign growth or manufacture which are consumed in the State.

Political Division and Towns.—The State of Mississippi is divided into 56 counties. The following are the principal towns, with the population in 1840 :—*Columbus*, 141 miles N.E. from Jackson, is situated on the eastern bank of the Tombigbee, at the head of steam-boat navigation. Population, 4000. *Jackson*, the capital of the State, is situated on the west bank of the Pearl River. It contains an elegant state-house and a governor's house. Population 2100. A railroad connects Jackson with Vicksburg, 45 miles, and is continued E. to Brandon, 14 miles. *Natchez*, a city, is situated on the east bank of the Mississippi, mostly on a bluff 150 feet above the river. It is 292 miles N. from New Orleans by he course of the river. The houses are mostly of wood, and only one story high, but almost every house has a piazza and a balcony. The town contains a court-house, gaol, and 4 churches. Population, 4800. The lands in the neighbourhood produce much cotton, and Natchez is a great cotton-mart, and is rapidly improving. The Mississippi railroad is probably completed from Natchez to Jackson, 112 miles. *Vicksburg*, a city, is situated on the east bank of the Mississippi, 400 miles above New Orleans. The town is situated on the shelving declivity of high hills, and the houses are scattered in groups on the terraces. It contains a court-house, gaol, and 5 churches. Population, 3653. Steam-boats ply regularly to and from New Orleans and Vicksburg, whence also a railroad extends to Brandon, through Jackson.

History and Constitution.—The first settlements were formed in the neighbourhood of Natchez by some Frenchmen in the beginning of the last century, but they did not thrive. When the country was ceded to the British in 1763, some respectable settlements were founded in the same parts, but under the sway of the Spaniards (1783 to 1800) they again began to decline. In 1800 all that is now comprised in Mississippi and Alabama was formed into a territory by the name of Mississippi Territory. In 1817 this territory was divided into two portions, and the western was admitted into the Union as the State of Mississippi. The legislative body in 1848 consisted of 32 senators, who are elected for 4 years, and 92 representatives, who are elected for 2 years. Mississippi sends 2 senators and 4 representatives to Congress.

MISSISSIPPI COMPANY. [Law, John.]

MISSOURI, River. [Mississippi, River.]

MISSOURI, one of the United States of North America, lies between 36° and 40° 36′ N. lat., and 89° and 95° W. long. It is bounded N. by Iowa, E. by Illinois, Kentucky, and Tennessee, S. by Arkansas, and W. by the Indian Territory. Its mean length from N. to S. is 280 miles, and its mean width from E. to W. 225 miles. The area is 64,000 square miles. The population in 1840 was 383,702, of whom 58,240 were slaves.

Surface and Soil.—In the southern part of the State an extensive bottom-land extends along the Mississippi, as far north as opposite the mouth of the Ohio. It includes many large swamps, which are rendered almost impenetrable by a dense growth of trees, mostly cypress. The most extensive of these swamps, called the Great Swamp, commences near the head of the bottom and passes southwards to the mouth of the river St. Francis, penetrating far into the State of Arkansas. The high grounds along the Mississippi begin 12 miles below Cape Girardeau, and extend to the mouth of the river Missouri. This undulating country extends westward to the river Gasconade, occupying the basin of the Maramec as far south as the lead-mining district. It is diversified with prairies and forests, the lower lands being well wooded, but the high grounds very thinly. This is the most populous portion of the State.

Between the rivers Gasconade and Osage, both of which are affluents of the river Missouri, a range of low hills approaches the Missouri, rising from 150 to 200 feet above the level of its water. They are thinly wooded, and constitute the most northern offset of the Ozark Mountains. The country west of this mountain region, especially the basin of the Osage, resembles that which is east of the river Gasconade, its surface being undulating, and diversified with woodlands and prairies. The prairies occupy by far the largest part of the surface. This region however does not extend to the banks of the Missouri, being separated from it by a rich alluvial soil, which extends along the river from the mouth of the Osage to that of the Mine River, with a width of 4 or 5 miles. This bottom is probably the most fertile portion of the State. Opposite to it extends a similar bottom-land along the northern banks of the Missouri from Côte sans Dessein to the river Chariton. In the country north of the Missouri, which comprehends about one-third of the State, the fertile tracts are nearly exclusively confined to the bottoms along the Missouri and Mississippi.

Rivers.—The Mississippi washes the eastern boundary for 550 miles, and the Missouri traverses the state from west to east, with a winding course of about 400 miles. [Mississippi, River.] The Grand River and the Chariton fall into the Missouri on the north bank; the Gasconade, Osage, and Mine River, fall into it on the south. The Maramec and Salt River are affluents of the Mississippi.

Climate.—The climate of Missouri is cold and extremely variable. The winters are severe and long. The Missouri is frozen so hard for several weeks as to be safely crossed by loaded waggons

The summers are often hot, but subject to sudden and frequent changes of temperature.

Productions.—Wheat, oats, Indian corn, and tobacco, are the staples of this State; in the south-east portion some cotton is produced. Most of the vegetables and fruits of England would grow. Tobacco, hemp, and flax are cultivated on the bottoms along the Mississippi. Cattle abound where the bottoms and prairies are near one another. In summer they feed on the grass of the prairies, and in winter on the cane and rushes of the alluvial soil. Horses and hogs are numerous. The bison is met with in large herds on the prairies east and west of the Ozark Mountains, and also elk and deer. The fur trade is very considerable.

The minerals chiefly consist of lead, coal, iron, and salt. The principal lead region is on both sides of Big River, an affluent of the Maramec, and extends about 100 miles in length by 40 in width. The ore is of the richest quality, and is in sufficient abundance to supply the whole of the United States. Iron ore exists in mountainous masses 200 and 300 feet high, and some of them yield 80 per cent. of metal. Coal exists in several places, but it is not yet much worked. There are numerous other minerals.

Manufactures and Commerce.—Most manufactured articles are imported from the states east of the Mississippi. Commerce is limited to the export of Indian corn and live stock, with cotton in moderate quantity, and lead. The imports chiefly consist of manufactured goods and wine.

Political Division and Towns.—Missouri is divided into 62 counties. The following are the principal towns, with the population of each in 1840:—*St. Charles,* 20 miles N.W. from St. Louis, is situated on the north bank of the Missouri, on elevated ground. Population, 2,818. *Jefferson* is the capital of Missouri. It is situated on the south bank of the Missouri, about 20 miles W. from the mouth of the Osage. It contains a court-house, governor's house, and a state penitentiary. Population, 1174. *St. Louis,* a city, is situated on the west bank of the Mississippi, about 18 miles by water below the mouth of the Missouri, in 38° 36′ N. lat., 89° 56′ W. long. The river here has a double bank, and the city is chiefly built on the interior bank, which has a gradual rise, and is about 40 feet higher than the bank next the river. The city presents a very handsome appearance as seen from the opposite side of the river. It contains a city-hall, a theatre, a concert-hall, a Roman Catholic university, an episcopalian college, and several academies, a handsome cathedral, and 20 churches. It is excellently situated for commerce, and has water communication by the Mississippi, Missouri, Ohio, and Illinois with a vast extent of country, and numerous steam-boats ply from it in various directions. It is the chief western depôt of the American Fur Company. The population in 1844 was 30,000. *Potosi,* 111 miles E.S.E. from Jefferson, is yet a small place, but is situated in the centre of a district abounding in lead, iron, and other ores. It contains a court-house, gaol, and 4 churches. Population about 1000.

History and Constitution.—Though this country for more than a century had been visited by the French from Canada, no settlement was formed before 1763. St. Louis was founded in 1764. In 1803 the United States got possession of the country, which was then comprehended in Louisiana. The following year the state now called Louisiana was separated from it, and Missouri became a separate Territory. In 1821 it was admitted as a member of the Union, and formed its constitution. The legislative body in 1848 consisted of 18 senators, who are elected for 4 years, and 49 representatives, who are elected for 2 years. It sends 2 senators and 5 representatives to Congress.

MIST, the vapour of water, rendered visible by the temperature of the air being reduced below that of the vapour. When the mist is very thick it is called a *fog.* Water, in the state of vapour, is continually rising into the atmosphere at all the usual temperatures; but in very hot weather the air is not easily saturated with vapour, and in cold weather evaporation is slow: thus there is more vapour in the air in summer than in winter, and in hot countries than in temperate climates, in all cases where similar surfaces of water are exposed to the sun's rays. Indeed, it has been found that the quantity of vapour in the air diminishes nearly uniformly with the temperature from the equator to the poles.

As every reduction of the temperature of the air has a tendency to destroy the transparency of the vapour which it contains, the atmosphere in our variable climate is seldom very clear. Soon after sunrise however, in fair weather, the vapour near the earth having been precipitated by the night-cold in the form of dew, and the sloping rays of the sun having little power to raise more vapour, the air is almost perfectly transparent, and every object has a clearness and sharpness of outline which it never has at any other time of the day. [Cloud; Dew.]

MITAU. [Courland.]

MITCHELSTOWN. [Cork.]

MITE. [Acarus.]

MITFORD, WILLIAM, the eldest son of John Mitford, of Exbury in Hampshire, was born in London on the 10th of February, 1744. He became a student of Queen's College, Oxford, but he left the university without taking a degree. He studied law for a time in the Middle Temple, but having succeeded to the family estate in 1761, on his father's death, he abandoned the profession. His younger brother became a chancery lawyer, and was afterwards Lord Redesdale. In 1756 Mr. Mitford married; and for seven years afterwards his time was chiefly spent in the retirement of his country seat. In 1769 he became a captain in the South Hampshire Militia, of which the historian Gibbon was then major; and the conversation and advice of Gibbon confirmed, if they did not prompt, his resolution to undertake a history of Greece. His first work, 'An Inquiry into the Principles of Harmony in Languages, and of the Mechanism of Verse, Modern and Ancient,' appeared in 1774, and was reprinted in 1804. He sat several times in the House of Commons. He died at

his residence on the borders of the New Forest, on the 8th of February, 1827.

His 'History of Greece' was written and published in successive portions. It closes with the death of Alexander the Great; and the author, enfeebled by age and partly blind, was unable to execute his intention of continuing it to the subjugation of Greece by the Romans. In 1815 appeared an octavo edition of the volumes which had previously been published; and in 1829 there appeared a new edition of the whole work, in eight octavo volumes (since reprinted), with an introduction by his brother, Lord Redesdale, which contains some particulars of the author's life, but is chiefly taken up in vindicating the political opinions expressed in the work. Mitford's opinions were of the kind called anti-democratic; and they have affected very seriously the fairness of the estimate which he forms both of characters and of events. The style of his work is very faulty, and the narrative is deficient in animation. The author deserves the credit of labour and of a diligent study of the original sources; and this is all that many critics will allow him.

MITHRIDA'TES, or MITHRADA'TES, a common name among the Medes and Persians, which appears to have been formed from *Mitra*, or *Mithra*, the Persian name for the sun, and the root *da*, signifying 'to give,' which occurs in most of the Indo-Germanic languages. The name was written in several ways. On the Greek coins it is written Mithradates.

The most celebrated race of princes of the name of Mithridates were the kings of Pontus, who were descended from Artabazes, one of the seven Persian chiefs who overthrew the Magi, B.C. 521. (Florus, iii. 5; Diod., xix. 40; Polyb., v. 43.) The most distinguished of these kings was

MITHRIDATES VI., B.C. 120, surnamed Eúpator, and called the Great, was one of the most formidable enemies that the Romans ever encountered. He was only 11 years old at the death of his father; and during his minority his life was frequently in danger from the numerous conspiracies against him. Mithridates possessed a strong mind and a vigorous body; he excelled in all athletic sports, and was distinguished in his early years by his bodily strength and his daring spirit. He had also paid great attention to the study of philosophy and polite literature; and, according to Pliny, was able to converse in twenty-two different languages.

As soon as Mithridates was old enough to take the government into his own hands, he reduced to subjection the Colchi and the other barbarous nations on the eastern shores of the Black Sea. The next acquisition which he made was Paphlagonia, part of which he gave to Nicomédes II., king of Bithynia, who was, next to Mithridates, the most powerful king in Asia Minor. But the kingdom of Cappadocia soon became a cause of war between the two kings, and Nicomedes applied to the Romans, who declared both Cappadocia and Paphlagonia to be free states, but allowed the Cappadocians to elect Ariobarzánes as their king. Mithridates now entered into alliance with Tigranes, king of Armenia, to whom he gave his daughter in marriage; and with his assistance he expelled Ariobarzanes from his kingdom, and also deprived Nicomedes III., who had lately succeeded his father, of Bithynia. The two expelled kings applied to the Romans for assistance, who reinstated them in their kingdoms, and sent an army, under the command of Aquilius, to support them.

Mithridates defeated the Roman armies, and in B.C. 88 the whole of Asia Minor was in his hands. In the same year all the Romans in the different provinces of Asia Minor, to the number, it is said, of 80,000, were massacred by the inhabitants. Athens also submitted to Mithridates, together with several other places in Greece.

In B.C. 87 Sulla arrived in Greece, and immediately commenced the siege of Athens, which was taken on the 1st of March in the following year. Sulla followed up this success by the defeat of Archeláus, the general of Mithridates, in Bœotia. In B.C. 84 Sulla made peace with Mithridates, on condition that he should abandon all his conquests in Asia, and restore Bithynia to Nicomedes, and Cappadocia to Ariobarzanes.

In B.C. 75 Mithridates broke the treaty which existed between him and the Romans by the invasion of Bithynia. Lucullus was appointed to the command of the Roman forces, B.C. 74, and commenced the campaign by taking Cyzicus, a city on the Propontis. He afterwards defeated Mithridates on the borders of Pontus and Bithynia, and the king fled into Armenia, to his son-in-law Tigranes.

In B.C. 69 Tigranes was defeated by Lucullus during the absence of Mithridates, near his capital Tigranocerta, which was soon after taken. In the following year Tigranes was again defeated, together with Mithridates, near Artáxata; but Lucullus was not able to derive all the advantages he might have done from his victories, in consequence of the mutinous disposition of his troops. Mithridates collected another army, and, having returned to Pontus, he defeated the Roman general Triarius, before Lucullus could march to his assistance. This victory was followed by others; and the Romans appeared to be on the point of losing all the acquisitions they had made during the war. But the power of Mithridates had been shaken; and on the appointment of Cn. Pompeius to the command, B.C. 66, the war was soon brought to an end. Mithridates was defeated on the banks of the Euphrates; and in consequence of Tigranes having submitted to Pompeius he fled to the barbarous tribes dwelling to the north of Caucasus. In B.C. 63 Mithridates put an end to his life, at the age of 68 or 69, after a reign of fifty-seven years.

MI'TTIMUS, a legal term applied to certain writs and warrants in which the word *mittimus* 'We (the king) send,' is expressed or implied.

The term is however in more frequent use as applied to the warrant by which magistrates commit and *send* persons charged before them with offences to the proper custody, in order that they may be forthcoming to answer the charge. This warrant may be either in the name of the king or in that of the committing magistrate, but the term

'mittimus' is used even when the latter, which is now the more common course, is adopted.

MITYLENE. [LESBOS.]

MI-VOIE. [MORBIHAN.]

MIXTURES, in Pharmacy, signify liquid medicines consisting of several ingredients, either in a state of mechanical suspension in some viscid medium, or in a state of complete solution. In preparing these, care must be taken not to mix in the same prescription substances which exercise an antagonizing action on the body, or which are incompatible, from one ingredient decomposing another.

MOABITES, a people descended from Moab, the son of Lot by his elder daughter (Gen. xix. 37), and consequently related to the Ammonites, with whom we find them closely connected in their subsequent history, which is to be found in various parts of the Scriptures. [AMMONITES.] The earliest accounts represent them as dwelling in the country on the east of the Dead Sea and the river Jordan, on both banks of the river Arnon (Wady Modjeb), from which they had driven out the Emim, who were said to be a tribe of giants. (Deut. ii. 11; Gen. xiv. 5.) The plains on the east of the Jordan near its mouth were called from them the Plains of Moab. (Numb. xxii. 1; Josh. xiii. 32; Deut. xxxiv. 1, 8.) Before the invasion of Canaan by the Israelites they had been dispossessed by the Amorites of the country north of the Arnon, which was thenceforth their northern boundary. (Numb. xxi. 13, 26; xxii. 36; Judges xi. 18.) [AMORITES.] At the division of Canaan among the tribes of Israel, this tract of country was given to Reuben and Gad. By the command of God, the Israelites left Moab in undisturbed possession of their country. (Deut. ii. 9; Judges xi. 15, 18; 2 Chron. xx. 10.)

MOATE. [MEATH, WEST.]

MOBILE. [ALABAMA.]

MOCHA, or MOKHA, a fortified town and a port, in the province of Yemen, in Arabia, is situated on the eastern shore of the Red Sea, near its mouth, in 13° 26′ N. lat., 43° 26′ E. long. The Mocha coffee is brought from the interior for shipment, and also gums, myrrh, frankincense, indigo, senna, and other articles. The town contains several mosques and caravanseries, and a population of about 6000. The port is commodious.

MOCHA STONE. [AGATE.]

MOCKING BIRD, the vulgar name for that extraordinary songster, the *Mimic Thrush* of Latham, *Turdus polyglottus* of Linnæus, and *Orpheus polyglottus* of Swainson.

'The Mocking Bird,' says Wilson, 'inhabits a very considerable extent of both North and South America, having been traced from the states of New England to Brazil, and also among many of the adjacent islands; much more numerous in those states south than in those north of the river Delaware, being generally migratory in the latter, and resident (at least many of them) in the former. A warm climate and low country, not far from the sea, seem most congenial to their nature; accordingly we find the species less numerous to the west than east of the great range of the Alleghany, in the same parallels of latitude. In the severe winter of 1808–9, I found these birds occasionally from Fredericksburg in Virginia to the southern parts of Georgia.'

Mocking Bird (*Turdus polyglottus*).

Wilson and Audubon have both expatiated on the astonishing vocal powers of this wonderful song-bird, and the grace and elegance of its actions. The following is a portion of Wilson's description:—'The ease, elegance, and rapidity of his movements, the animation of his eye, and the intelligence he displays in listening and laying up lessons from almost every species of the feathered creation within his hearing, are really surprising, and mark the peculiarity of his genius. To these qualities we may add that of a voice, full, strong, musical, and capable of almost every modulation, from the clear mellow tones of the wood-thrush, to the savage scream of the bald eagle. In measure and accent he faithfully follows his originals; in force and sweetness of expression he greatly improves upon them. In his native groves, mounted on the top of a tall bush or half-grown tree, in the dawn of dewy morning, while the woods are already vocal with a multitude of warblers, his admirable song rises pre-eminent over every competitor. The ear can listen to his music alone, to which that of all the others seems a mere accompaniment. Neither is this strain altogether imitative. His own native notes, which are easily distinguishable by such as are well acquainted with those of our various song-birds, are bold and full, and varied seemingly beyond all limits. They consist of short expressions of two, three, or at the most five or six syllables, generally interspersed with imitations, and all of them uttered with great emphasis and rapidity, and continued with undiminished ardour for half an hour or an hour at a time. His expanded wings and tail, glistening with white, and the buoyant gaiety of his action, arrests the eye, as his song most irresistibly does the ear. He sweeps round with enthusiastic ecstacy; he mounts and descends as his song swells and dies away; and, as my friend Mr. Bartram has beautifully expressed it, "He bounds aloft with the celerity of an arrow, as if to recover or recal his very soul, expired in the last elevated strain." While thus exerting himself, a bystander, destitute of sight, would sup-

pose that the whole feathered tribes had assembled together on a trial of skill, each striving to produce his utmost effect, so perfect are his imitations. He many times deceives the sportsman, and sends him in search of birds that perhaps are not within miles of him, but whose notes he exactly imitates; even birds themselves are frequently imposed on by this admirable mimic, and are decoyed by the fancied calls of their mates, or dive with precipitation into the depths of thickets at the scream of what they suppose to be the sparrow hawk.'

The mocking-bird builds a nest of twigs, leaves, grasses, cotton, flax, &c., in the fork of a branch; the eggs, five in number, are pale green, blotched and spotted with umber brown.

Mr. Darwin ('Journal and Remarks,') notices, in his account of Maldonado, a mocking-bird, *Orpheus Modulator*, called by the inhabitants Calandria, as remarkable for possessing a song far superior to that of any other bird in the country: indeed it was nearly the only bird in South America which he observed to take its stand for the purpose of singing. He compares the song to that of the sedge-warbler, but says that it is more powerful, and that some harsh notes and some very high ones are mingled with a pleasant warbling. It is heard only during spring: at other times its cry is harsh, and far from harmonious. He states that near Maldonado these birds were tame and bold, constantly attending the country-houses in numbers, to pick the meat which was hung up on the posts or walls; but if any other small bird approached, the Calandria drove it away. Mr. Darwin adds, that, on the wide uninhabited plains of Patagonia, another closely allied species, *Orpheus Patagonicus* of D'Orbigny, which frequents the valleys clothed with spiny bushes, is a wilder bird, and has a slightly different tone of voice.

MODBURY. [Devonshire.]

MODE, in Ancient Music, is the order of the sounds forming the different scales.

In the earliest Greek music whereof we have any account there were but three modes, of which the key-notes were at the distance of one tone from each other. The lowest of these was called the *Dorian*, the highest the *Lydian*, and the *Phrygian* was placed between the other two. Subsequently, by dividing the tones into semitones, two other modes were produced—the *Ionian* and the *Æolian*, the first of which was placed between the Dorian and Phrygian, and the second between the Phrygian and Lydian. At length, by extending the system above and below, new modes were established, which took their names from the former five, adding the preposition *hyper* (ὑπέρ, *above*) for the higher, and *hypo* (ὑπό, *below*) for the lower. Seven of these fifteen modes were retained in later times; and, by being combined with a new one, called the hypo-mixo-Lydian, they formed the eight ecclesiastical modes or tones of the Catholic Church.

Mode, in modern musical language, signifies the same as Key, but is very rarely used in that sense.

MODELLING. Modelling in clay requires the aid of a few tools; but no tool is more useful than the finger; indeed tools have been invented as mere aids to the fingers, and are designed only to do what they cannot perform. Wire tools are the most useful, being fashioned into loops of various shapes and sizes, round and angular, and fixed into wooden handles. The wooden tools are made of box and ebony, of various shapes and sizes—curved, straight, pointed, rounded, and flat and broad; the broad tools being notched, and designed chiefly for working the large convex masses, or large folds in drapery.

The clay used is common potters' clay, but of the best quality. It must be so wet that it will not stand in a mass much higher than its own width without support. The supports for the clay are a most important consideration, for if not properly attended to, the finished work, the fruits of months of labour, might suddenly fall to pieces by its own weight. Sculptors generally model figures of the ordinary size upon a bench or stand called a banker, about 30 inches high, and about 30 inches square,—for a bust it must of course be much higher; above this a solid circular plinth is fixed on a wooden bos, and is revolved upon six or more wheels, or what are better, short slightly conical rollers, fixed to the plinth near the circumference. A revolving plinth is necessary to enable the sculptor to see his work on all sides in any light, and it enables him to work on all parts, in one spot, or in the same light. On the centre of the plinth is built up a skeleton frame-work of iron and wood, projecting in various directions to support the various parts of the figure.

Another essential part of modelling is preserving the moisture of the clay, which should be always uniform if possible; it must never be allowed to dry, and it can be kept moist with very little trouble. While the modeller is at work, and the figure is exposed, especially in warm weather, he should repeatedly sprinkle it with water. A plasterer's brush is the best instrument for this purpose. When the model is complete, the next process is to take the cast, to work the marble from, or to make other casts from. The ancient sculptors used to bake their models, but this is not so good a plan as making plaster casts from them, though less troublesome and much cheaper.

MODELS, ARCHITECTURAL. Besides the usual delineations upon paper showing the plans and different parts of a building, and their details in elevations, sections, and working drawings, a solid representation or miniature facsimile of the proposed edifice is sometimes formed. Models of this kind are variously executed, and more or less finished up, as may be required. Many are made of wood, plaster of Paris, cardboard, and sometimes of cork. They are but little used for interiors.

MO'DENA, a duchy in North Italy, extending N. of the central ridge of the Apennines towards the Po, is bounded W. by Parma, S. by Garfagnana and Tuscany, and E. by the Papal State. Modena has, including its portion of Garfagnana, and the duchy of Massa-Carrara [Carrara], an area of 2120 square miles, and a population in 1847 of 515,343. The administrative divisions

are:—the province of *Modena*, which contains 755½ square miles, and 222,711 inhabitants, and is divided into 26 communes: the province of *Reggio*, which extends west of that of Modena, and contains 753½ square miles, with a population of 172,693, distributed over 12 communes: the province of GARFAGNANA, with an area of 154 square miles and 31,717 inhabitants, distributed among 15 communes: the province of *Massa-e-Lunigiana*, which consists of 12 communes, containing 196 square miles and 55,220 inhabitants. [CARRARA.]

About one-half of the territory is covered by the Apennines and their offsets; one-third more forms part of the great plain of Lombardy, and is very fertile; and a small strip extends along the shores of the Mediterranean. Of the mountainous part some valleys are tolerably fertile, but the greater part is either rocky or covered with oak and chestnut trees. The highest summits of the Apennines are, Monte Cimone (7000 feet) and Camporaghena (6500). The snow generally leaves these summits in the month of April. The principal rivers of the Modenese territory are, the *Secchia*, which rises in the Apennines of Camporaghena, and flowing through the whole length of the duchy of Modena, passes near the capital, and, after a course of nearly 100 miles, enters the Po within the borders of Mantua: the *Panaro*, which rises at the foot of Monte Cimone, and, running in a parallel direction to the Secchia, waters the eastern part of the duchy, and then enters the territory of Ferrara, where it falls into the Po: and the *Crostolo*, which rises in one of the lower ridges of the Apennines, passes near Reggio and by Guastalla, below which it enters the Po. In the plain of Modena artesian wells have been in use from time immemorial; many of them are of very considerable depth, and the supply of water is abundant. South of the Apennines the Magra crosses the territory of Lunigiana, and enters the sea west of Carrara. The Serchio is the river of Garfagnana. The chief products of the country are corn, maize, pulse, chestnuts, hemp, oil, wine, silk, and fruits. Horned cattle and swine are exported in considerable numbers. The other articles of exportation are fruit, silk, corn, brandy, wine, and vinegar. The manufactures of the duchy consist of woollens, silks, gauzes, paper, straw-hats, glass, and pottery. There are abundant sources of petroleum in several parts of the duchy.

The principal town is *Modena*, the Roman *Mutina*, which is situated 59 miles N. by W. from Florence, in 44° 37′ N. lat., 10° 57′ E. long., in the centre of a wide plain between the Panaro and the Secchia, and has 27,000 inhabitants. The town is well built, and has several handsome churches and palaces. Most of the streets have arcades on each side. The ducal palace is a magnificent princely residence; it contains a fine gallery of paintings by the great masters, and a valuable library of 90,000 printed volumes and 3000 MSS. The cathedral, a gothic building of the 11th century, is remarkable chiefly for its lofty square marble tower. The other remarkable buildings are, the theatre, the college, the barracks, the hospital, and the old citadel, which is now used as a penitentiary. A canal uniting the Secchia with the Panaro affords a line of boat navigation between Modena and the Po.

Reggio, the *Rhegium Lepidi* of the Romans, a walled town in the midst of a fine and fertile plain, is well built; it has a fine cathedral, several handsome churches, a lyceum, a theatre, an old castle, in which Ariosto was born, some manufactories of linen and silks, and nearly 20,000 inhabitants. *Mirandola*, an old looking town, in a low unhealthy flat in which rice is grown, has several churches, and about 4600 inhabitants. *Finale*, near the borders of Ferrara, has 6000 inhabitants. *Correggio*, the birth-place of the great painter, Antonio Allegri; population 2500. *Concordia*, which stands on the Secchia, has 300 inhabitants. *Carpi*, on the high road from Modena to Mantua, has 3000 inhabitants, an old castle, and some manufactories.

MO'DENA or MU'TINA, TOMMA'SO DA, a painter of Modena, of the 14th century. His altar-piece of the Virgin and Child, with Saints Wenceslas and Palmatius, patrons of Bohemia, now in the gallery of the Belvidere at Vienna, was said to be an oil painting, and in Von Mechel's Catalogue is said to have been painted in 1297. It was therefore eagerly caught at by writers of Germany and Italy, to vindicate the title of their respective countries in opposition to the Flemish claim. This picture, however, bears no date, and chemical analysis has shown that it is a *tempera* painting.

There is an extensive work bearing his name, a series of many portraits, in the chapter-house of the Dominicans at Trevigi, which Fra Federici, a Dominican, has had engraved for his account of the antiquities of Trevigi—'Memorie Trevigiane su le Opere di Disegno.' They were painted in 1352. These works are completely in the style of their time, but rather above the standard than otherwise.

MODES, *Ecclesiastical.* In what is called the Gregorian Chant there are eight modes, or tones —four Authentic, and four Plagal. The Authentic modes were chosen by St. Ambrose, about the year 370, for the church of Milan. The Plagal modes were added by St. Gregory about 280 years after the adoption of the former.

MODESTI'NUS, HERENNIUS, lived under the Emperor Alexander Severus, and was one of his legal advisers; he also taught law to the younger Maximinus. The Florentine Index enumerates the following works of Modestinus: 19 books of Responsa, 12 books of Pandects, 10 books of Regulæ, 9 books of Differentiæ, 6 books of Excusationes, 4 books on Poenæ. The work on Excusationes was written in Greek. Nine other works by Modestinus, in single books, are enumerated in the Florentine Index.

The period of Modestinus is determined by an inscription, which contains the judgment in a suit which was prosecuted some time between A.D. 227 and 245. Modestinus is mentioned in a rescript, of A.D. 239, of the Emperor Gordianus. There are 345 excerpts from Modestinus in the Digest.

MODILLION (Architecture), an ornamental member in the Corinthian cornice, resembling a small bracket placed horizontally, that is, with its back against the soffit of the part it supports, in which respect it differs from the Console. Modillions are placed beneath the corona of the cornice, and although sometimes omitted out of parsimony, are indispensable to the character of the order.

MODULATION, in Music, is a changing of the key, or *mode*, during the progress of a composition.

Modulation may be divided into Simple, Chromatic, and Enharmonic. Simple Modulation is a change from a given key to another nearly related to it, namely, its fifth, fourth, relative minor, or relative minor to its fifth; and this modulation, not to be abrupt, is effected by at least one intermediate chord, which must belong to the harmony of the key into which it is intended to pass. Chromatic Modulation is the change from a given key to some other not analogous to it; that is, to one differing much in scale, and consequently in signature. Enharmonic Modulation is the change from a given key to another quite unanalogous, by means of an enharmonic interval.

MODUS. [Tithes.]

MŒHRINGIA, a genus of plants belonging to the natural order *Caryophylleæ*. *M. trinervia* is found in damp shady places, and is a native of Great Britain. Four other species of this genus are described by Koch in his 'Flora Germanica;' —*M. muscosa, M. prona, M. polygonoides,* and *M. villosa.*

MŒNCHIA, a genus of plants belonging to the natural order *Caryophylleæ*. *M. erecta* is the only British species. It is a small glaucous plant growing in dry gravelly and sandy places.

MŒSIA, the name of a province of the Roman empire, extending north of the range of Mount Hæmus, the modern Balkan, as far as the Danube, and eastward to the Euxine, and corresponding to the present provinces of Servia and Bulgaria. Its boundaries on the west were the rivers Drinus and Savus, which divided it from Pannonia and Illyricum.

MOFFAT. [Dumfriesshire.]

MOGADORE. [Marocco.]

MOGUL EMPIRE is the name commonly given to the empire founded in Hindustan by the successors of Timur, in the 16th century. Baber, a descendant of Timur, and a prince of the Jaghatai Turki tribe, after conquering Samarcand, Bokhara, and Cabul, crossed the Indus, and invaded the Panjab. He marched upon Delhi, defeated and killed Sultan Ibrahim Lodi, the Afghan sovereign of Hindustan, took Agra, defeated Rana Sanka, a powerful Hindoo prince, extended his conquests to the mouths of the Ganges, and established his Tatar dynasty over those vast regions, 1526-8. As he had many Mongols in his service, and as he was a successor of Timur Beg, who, though a Turki-Tatar himself, and not a Mongol, had re-united for a time the old Mongol empire of Gengis Khan, the dynasty established by Baber in India became known in Europe by the name of the Mogul empire, and the misnomer has perpetuated itself in history. [Mongolia.]

After Baber followed a succession of sovereigns, whose reigns were all more or less disturbed by the invasion of the Mahrattas, Rohillas, Patans, and other predatory bands, whose incursions led to continual warfare and calamity. At length, after the defeat of the Soubahdar of Bengal, Suraja al Dowlat, by the British forces, Shah Alim II., who had assumed the sovereignty, surrendered his dominions to the East India Company, which gave him the town of Allahabad, and part of that province, for his subsistence. After numerous subsequent vicissitudes, Shah Alim died in 1806, a pensioner of England; and with him the empire of the house of Timur, commonly known as the Mogul Empire, may be considered as having terminated. [Hindustan, vii. 221.]

MOHACZ. [Baranya.]

MOHAMMED, ABUL KASEM IBN ABDOLLAH, was born at Mecca, on November 10, 570, or, according to other authorities, on April 21, 571. His father Abdollah, whose only son he was, belonged to the family of Hashem, the most distinguished branch of the noble tribe of Koreish, which claimed a direct descent from Ishmael, the reputed progenitor of the Arabian race, and had acquired a decided superiority over the surrounding tribes. In his early childhood Mohammed lost both his parents; his mother Amina died in his second year, and the child was committed to the care of his grandfather, Abdol Motaleb, chief priest of the Caaba. Abdol Motaleb was succeeded by Abu Taleb, the uncle of Mohammed, who also became his guardian.

A Nestorian monk, the abbot of a monastery at Basra, named Boheira, was the first who observed and appreciated the character of young Mohammed. After having conversed with him on religious subjects, he foretold to his uncle Abu Taleb that great expectations might be conceived of the boy provided he should escape the snares of persecuting Jews. In the 25th year of his age Mohammed became acquainted with a rich widow, Khadija, whom he subsequently married; and during the fifteen following years little more is known of him than that he frequently retired to the cave of Heva, in the neighbouring mountains, and also made a journey into Syria and occasional visits to the southern parts of Arabia. In the 40th year of his age Mohammed assumed the prophetic office, and displayed his views and principles to his own domestic circle. His first efforts were successful, for his wife Khadija, Waraka, Abubeker, his cousin-german Ali ben Abi Taleb, and several other members of the family, readily acknowledged his divine mission, and himself as the apostle of Allah.

After being three years silently employed in the conversion of his nearest friends, he invited the most illustrious men of the tribe of Hashem to his house, and publicly proclaimed his calling and declared that by the command of the one God, revealed to him by the angel Gabriel, he felt compelled to impart to his countrymen the most precious gift, and the only means of their future

salvation. Far from being persuaded, the assembly was struck silent with surprise mingled with contempt. The young and enthusiastic Ali alone, throwing himself at the feet of Mohammed, with a solemn vow offered to be his companion. Mohammed was repeatedly urged by his doubting countrymen to confirm his divine mission by miracles, but he appealed to the internal truth of his doctrine, and expressly declared that wonders and signs would depreciate the merit of faith and aggravate the guilt of infidelity.

In the meantime several of the noblest citizens, such as Abu Obeida, Hamza, an uncle of Mohammed, Othman, and the stern and inflexible Omar, were successively gained by the moderation and influence of Abubeker, with whom, by marrying his only daughter Ayesha, the prophet had become more nearly allied after the death of his wife Khadija. Nevertheless, for more than ten years the new faith made little progress within the walls of Mecca. At last a revolt, which threatened the life of Mohammed, broke out at Mecca, and the prophet took his flight to Yatreb, afterwards known by the name of Medina (Medinat-al-Nabi), or the city of the prophet. This retreat happened on July 16, 622, and has been adopted as the Mohammedan æra, called Hejira. The citizens of Medina, among whom the seeds of Islam had been sown by some converted pilgrims returning from Mecca, were readily inclined to embrace the cause of the reformer, whom they had often invited by several previous deputations, and to whom they had promised their alliance and protection against his enemies. From this moment a vast theatre opened to the enthusiasm and ambition of Mohammed. His revelations assumed a much higher claim; he inculcated as a matter of religion and of faith the waging of war against the infidels; and the sword once drawn remained unsheathed until the tribes of all Arabia and the adjacent countries had joined in the profession that there is no God but Allah, and that Mohammed is his apostle. After consolidating his power in Arabia, Syria and Palestine were subdued. Returning from these military expeditions, and having once more accomplished a solemn pilgrimage to the temple of Mecca, Mohammed retired to Medina, where, to the great consternation of his followers, he died. This event happened on June 8, 632, in the 63rd year of his age. Omar, with many enthusiastic disciples, firmly believed that a prophet could never die; and it required all the authority of the sober and prudent Abubeker to refute so absurd an opinion.

The Korân (*lecture*), or with the Arabic article Alkorân, commonly called The Book, or Book of Allah, is a collection of all those various fragments which the prophet, during the time of his apostolic office, successively promulgated as so many revelations from heaven. They had been originally preserved by oral tradition, or handed about in fragments, written on palm-leaves and pieces of parchment by the slave of Mohammed, Said ben Thabet. The scattered leaves were collected into a volume by Abubeker, two years after the death of the prophet; but many apocryphal additions having crept into the collection, an authentic copy was afterwards revised and sanctioned by the Caliph Omar (652). The religious system of Mohammed, designated by the name of *Islam*, or salvation, is displayed throughout the Korân in single and often-repeated precepts. It consists of two parts; of a dogmatical (or Imân) faith, and a practical (or Dîn) religion. The principal articles of belief are the following:—There is but one God, by whose divine providence and absolute predestination the destinies of mankind have from eternity been decreed. The will of God and his divine law were often and fully declared by the former prophets, Adam, Noah, Abraham, Moses, and Christ, whose authority and station rise in just gradation above each other; among whom Abraham is the chief prototype of a true believer. But Mohammed is the last and by far the most illustrious apostle; with him, who is the seal of the prophets (xxiii. 40), the divine missions have ceased; and as the Scripture and Gospels have been altered by superstitious Jews and idolatrous Christians, the Korân must be revered as the only genuine revelation by which former religions are corroborated and verified (ii., 89; xlvi., 11). The soul of man is immortal, and at the day of resurrection and the final judgment of mankind every one shall receive the just reward of his virtues, or the punishment due to his evil deeds. Sinners, and particularly unbelievers and idolaters, shall be hurled about in a dark or burning hell; whereas the virtuous and pious Moslems shall be rewarded with everlasting happiness in a paradise enlivened by heavenly virgins, and abounding with shady groves, clear streams of water, and delicious fruits—ths most desirable enjoyments in the sandy deserts of Arabia. But the hope of salvation is not confined to the Moslem, for every man who believes in God and does good works shall be saved.

MOHAWKS. [North-American Indians.]

MOHILEV, or MOGILEV, a government of European Russsia, lying between 53° 5′ and 55° 10′ N. lat., 28° 50′ and 32° 40′ E. long., is bounded N. by Vitepsk, N.E. by Smolensk, S.E. and S. by Tschernigov, and W. by Minsk. The area is 18,724 square miles, and the population in 1846 was 931,300. It is part of the flat tract of Russia, and contains no mountains. The surface is in general dry and the soil productive. The principal river is the Dnieper, which enters the government on the north-eastern boundary, and runs W. as far as Orscha, whence it flows S. to its junction with the Berezina; from this point it forms the south-western boundary; of the other rivers, all feeders of the Dnieper, the largest are the Soj and the Druez. The climate is dry and mild. The chief occupations of the inhabitants are agriculture and the breeding of cattle. Rye, wheat, barley, oats, and buckwheat, are raised. Hemp and flax are staple articles, and cultivated for exportation. Peas, beans, hops, poppies, and all kinds of fruit, especially pears, apples, and cherries, are cultivated in the gardens. In the forests and low grounds there are prodigious quantities of bilberries. The forests are a great source of wealth to the province. The pastures

are good. The horses and cattle are of inferior breed; the breed of sheep has been improved of late years by crossing with the Saxon sheep. Game of all kinds abounds. The fisheries are productive. The chief mineral is bog-iron. The manufactories are tanneries, glass and iron works, and paper-mills. The commerce consists in the exportation of corn, flour, flax, hemp, linseed, timber, cattle, honey, wax, wool, tallow, hides, and some manufactures. The principal trading towns are Mohilev and Mstislawl.

Mohilev, the capital of the province, is a considerable town, situated in 53° 50′ N. lat., 30° 25′ E. long., in a pleasant well-cultivated country on the left bank of the Dnieper, and has 21,080 inhabitants. It is the residence of the civil and military governors, of a Greek archbishop, and of the Catholic primate of Russia and Poland. The city is surrounded by a decayed rampart, and is divided into four quarters. Many of the streets are broad and paved, and in the centre of the city there is a large square. The public edifices are numerous, and some of them rather splendid, as the church of St.-Joseph. The town has a theological college, a gymnasium, and an infirmary; some manufactories of ironware and leather; and a considerable trade in corn with Odessa by the Dnieper.

The other principal towns are *Mstislawl*, 5000 inhabitants; *Dubrowna*, 4000 inhabitants; Skiow, a fortified place, 2500 inhabitants; and *Orscha*, 4000 inhabitants.

MOIDORE. [Money.]

MOISSAC. [Tarn-et-Garonne.]

MOITTE, JEAN GUILLAUME, Chevalier, the son of the engraver P. E. Moitte, was born at Paris in 1747. He was first the pupil of Pigal, after whose death he studied under Lemoyne. In 1768 he obtained the grand prize in sculpture for a statue of David carrying the head of Goliath. Moitte was a member of the old French Academy of Painting and Sculpture, and afterwards of the Institute of France, and a Chevalier of the Legion d'Honneur. He died in 1810.

Moitte has executed many excellent bas-reliefs and figures, and some equestrian statues. His principal works are a marble statue of Cassini; the basso-rilievo on the front of the Pantheon; and the colossal figures of Bretagne and Normandie, at the barrier des Bons Hommes.

MOIVRE, DE. [De Moivre.]

MOLA. [Bari, Terra di.]

MOLA. There are two artists of this name, who were contemporaries, and both studied for a time under Albano.

Of these the more celebrated *Pierfrancesco Mola* was born at Coldre, in the Milanese territory, in 1621. He attained to great excellence both in design and colouring, and though his chief merit lay in landscape, he also painted history occasionally, and with much ability. He died at Rome in 1666. According to other notices of him, the dates both of his birth and death are respectively 1609 and 1665; and he is stated to have been born at Lugano.

Gianbattista Mola, who was not at all related to the preceding, but is said to have been of French extraction, was born in 1620. Like his namesake Pierfrancesco, Gianbattista was an excellent landscape painter, and well skilled also in perspective, though in other respects his inferior. He died in 1661.

MOLASSES, the uncrystallized syrup produced in the manufacture of sugar, and which is suffered to drain from the casks into a cistern, in what is called the curing-house, before the sugar is sent away from the plantation. [Sugar.] Part of the molasses is fermented and distilled for rum in the West Indies, and part is made to yield a little sugar by crystallization: the residue constitutes *Treacle*. In the year ending Jan. 5, 1849, the molasses imported into Great Britain amounted to 517,721 cwts.

MOLD. [Flintshire.]

MOLDA'VIA, a province of northern Turkey, situated between 45° 25′ and 48° 13′ N. lat., and 26° 10′ and 28° 30′ E. long. It is bounded on the east by Bessarabia, on the south by the Danube and Wallachia, on the west by Transylvania, and on the north by the Buckowine and a part of Gallicia. Its greatest length from south to north is about 200 miles, its breadth about 120, and its area about 17,000 square miles. Moldavia is divided into Upper Moldavia, or Tzara de Suss, which is subdivided into four districts, and Lower Moldavia, or Tzara de Shoss, which is subdivided into nine districts. The province contains offshoots from the Carpathian Mountains. It is watered by the Sireth and the Pruth, which flow into the Danube. The climate is very fluctuating, and slight earthquakes are frequent. The country possesses much mineral wealth, of which however little advantage has been taken, in consequence of the unsettled state in which the country has been for several centuries. There is an abundance of rock-salt in the vicinity of the Carpathian Mountains; asphaltum is found in several parts; and a great quantity of saltpetre is produced, chiefly in the northern part of the principality. The sand of the river Bistritza contains gold, but not in a large quantity. The soil is generally exceedingly fertile, and, notwithstanding a very inferior state of agriculture, produces every kind of grain and vegetable in the greatest abundance. A great number of horses, cattle, and sheep are fed on the rich meadows which Moldavia contains, and the forests produce a great quantity of timber.

Jassy, or *Yassy*, the capital of Moldavia, is situated on the Bachlei, a small muddy stream which flows into the Pruth. It is in 47° 9′ N. lat., and 27° 25′ E. long. It occupies a large area, and contains, among other buildings, the palace of the voyvod or governor. It has suffered terribly from fire, plague, and wars, and now presents a melancholy aspect; instead of well-built houses, it consists chiefly of wooden buildings one story high, with wide spaces vacant or filled with ruins. The present population of Yassy is probably not more than from 15,000 to 20,000, less than half of what it was in the early part of this century.

Galacz, or *Galatz*, on the Danube, in 45° 23′ N. lat., 28° 5′ E. long., is the only port, the

place of export and import for the whole province, and the chief medium of the commerce carried on between Germany and Constantinople, by way of the Danube. Galatz is for the most part better built than the other towns of Moldavia, having numerous houses of stone, several Greek churches, a convent, an hospital, and a large bazaar always well filled with merchandise, together with a great number of warehouses for grain and other produce; the streets however are narrow and dirty. Vessels of 300 tons burthen can come close up to the town. The population is about 12,000.

Fokzany is in 45° 41′ N. lat., and 27° 10′ E. long. It contains some Greek churches, a convent, and about 2000 inhabitants.

The population of Moldavia is about 450,000, and consists chiefly of Wallachians, Jews, Armenians, and gipseys.

The history of Moldavia is closely connected with that of Wallachia, from which it is separated only by a political boundary, having being originally the same country.

Moldavia was subjected to great devastations by the several hordes which invaded the Byzantine empire, and a great number of its inhabitants, descended from the Roman settlers, retired to the west of the Carpathian Mountains, in the present country of Hungary. About the middle of the thirteenth century a colony of the same inhabitants reoccupied the country, under a chieftain called Bogdan. From that time the rulers of Moldavia, called *voyvodes* (a Slavonic term which signifies military leader), were often subject to the kings of Hungary, but also frequently asserted their independence, until they submitted to the protection of the Turks in 1536. The voyvodes were to be elected by the principal clergy and the boyars, or nobles, and their election was to be confirmed by the sultan, who was not to interfere in the local administration of the principality, neither were Turks permitted to settle there. The chief terms of the agreement were maintained till 1711, when the Turks abolished the privilege of electing the voyvodes, and nominated to that dignity the Greek princes of the Fanar. [FANARIOTES.] The princes or voyvodes of Moldavia, called also *hospodars*, governed with the assistance of a council, called a divan, composed of twelve members.

Russia has long wished to possess this principality. In 1710, 1739, 1774, 1792, 1826, and 1829, succesive steps were taken calculated to strengthen the power of Russia in Moldavia, and weaken that of Turkey. A new constitution was agreed to by all parties in 1823, which gives to Moldavia the semblance of independent power; but she is falling yearly more under the influence of Russia.

MOLE. [TALPIDÆ.]

MOLFETTA. [BARI, TERRA DI.]

MOLIE'RE was the name assumed by Jean Baptiste Poquelin, who was born at Paris, on January 15, 1622. His father was a tapissier, and also held the office of 'valet-de-chambre-tapissier' to Louis XIII. Young Poquelin was sent to the College de Clermont, which was under the care of the Jesuits, where he remained till the end of the year 1641.

When his studies both in literature and philosophy were ended, he filled his father's office about the king's person, and attended Louis XIII. in the expedition from which resulted the taking of Perpignan from the Spaniards. In 1645 we find him performing in the Faubourg St. Germain, with a company of citizens who at first acted for pleasure, but afterwards attempted to combine profit with amusement. At this period he took the name of Molière. The company was unsuccessful. In 1653 he was playing at Languedoc, whither he had been invited, at the head of a company, by the Prince de Conti, who appreciated his histrionic talents. In this company was Madeleine Béjart, whose daughter subsequently became the wife of Molière. He afterwards went with his company to Lyon, where, in 1653, he produced his first play, 'L'Etourdi,' with much success. In 1654, having returned to Languedoc, he produced 'Le Dépit Amoureux,' which was likewise successful. After remaining four or five years in Languedoc, the company quitted that province for Grenoble, where they played during the carnival. They then went to Rouen, and finally to Paris, where Molière was introduced to the king, Louis XIV., before whom his company played the tragedy of 'Nicomède,' in 1658, at a theatre erected in the guard-hall of the old Louvre. In 1660 they removed to the Palais Royal.

In the previous year Molière had produced his celebrated 'Précieuses Ridicules;' and in 1660 'Le Cocu Imaginaire.' 'Don Garcie de Navarre,' brought out in 1661, was unsuccessful; but his fame was again raised by the 'École des Maris,' which was produced in the same year with great success. An excellent piece followed in the same year, called 'Les Fâcheux.' In 1662 appeared 'L'École des Femmes.' Molière was so indignant at the slight success of this piece, that in 1663 he produced another, called 'La Critique de l'École des Femmes,' in which he held up its opponents to public derision. A little piece entitled 'L'Impromptu de Versailles' was produced the same year, which consists merely of a satirical conversation among the Comedians. It is preceded by a 'Remerciement,' or poem of thanks to the king, who had, in the year of its production, granted Molière a pension of a thousand livres. Molière's happiness would have been greater had he not about this time married Armande Béjart, then about 17, whose lively and coquettish disposition kept him in all the agonies of jealousy. To relieve himself from domestic disquietude, he pursued his labours with additional ardour, and wrote 'Le Mariage Forcé,' and 'La Princesse d'Elide,' which were produced in 1664, and 'Le Festin de Pierre,' produced in 1665. In this year the king engaged Molière's company for his own service, granting them a pension of 7000 livres, and they took the title of the 'Troupe du Roi.' A little piece called 'L'Amour Médecin,' followed up the attack on the medical profession, which Molière had incidentally commenced in the 'Festin de Pierre.

His excellent comedy 'Le Misanthrope' was produced in 1666, and is reckoned among his chef-d'œuvres. In the same year appeared 'Le Médecin malgrè Lui,' a humorous attack on the physicians, well known to the English by Fielding's version, entitled the 'Mock Doctor.' With respect to the date of the celebrated comedy, 'Le Tartuffe,' there is a little difficulty. The first three acts of 'Le Tartuffe' seem to have been played in 1664, but the entire piece was not acted till 1667. However this may be, on its very first production the more bigoted part of the community were enraged; and such earnest applications were made to the king, that he ordered the piece to be withdrawn. The representations of Molière induced the king to revoke this order, but Molière did not consider it prudent to perform it at once. About the same period he produced three insignificant little pieces, 'Melicerte' (a mere fragment), 'Pastorale Comique,' and 'Le Sicilien;' and in 1668 appeared his 'Amphitryon.' The admirable comedy of 'L'Avare' seems to have been brought out in the same year, in which year also Molière ventured on a second representation of 'Le Tartuffe.' The first attempt had been prohibited, but an order having been obtained from the king, it was then played without interruption. 'Monsieur de Porceaugnac,' a farce representing the awkwardness of a pompous country gentleman in a large metropolis, was represented in 1669 with great success, and the famous 'Bourgeois Gentilhomme,' brought out in the following year, was equally fortunate. In 1672 Molière produced his 'Femmes Savantes,' one of his best comedies, in which the learned ladies and witlings of the time are admirably satirised.

In the year 1672 Molière became reconciled to his wife, with whom he had long been at variance, and at the same time quitted a milk diet, to which he had restricted himself on account of a complaint in the chest, for animal food. This increased his complaint, but he worked hard at the composition of 'Le Malade Imaginaire,' which was produced in 1673, and is one of his most entertaining pieces. On the third day of the representation of this comedy Molière felt the pain in his chest much increased; and, while acting the part of Argan, a convulsion seized him. Soon after his arrival at home he began to spit blood, which at length flowed from his mouth in such abundance as to suffocate him. The date of his death is February 17, 1673. The rites of sepulture were at first refused to Molière, but the king prevailed on the Archbishop of Paris to allow them, on condition that the ceremony should be celebrated without any pomp.

MOLINA. [Castilla-la-Nueva.]

MOLI'NA, LOUIS, born at Cuença in Castile, entered the order of Jesuits in 1553. He studied at Coimbra, became a learned divine, and taught theology for twenty years in the college of Evora. He died at Madrid in the year 1600. He wrote commentaries upon Thomas Aquinas, and a treatise 'De Justitia et Jure;' but the work which has rendered his name famous as the head of a school of theology is his book, 'De Concordia Gratiæ et Liberi Arbitrii,' printed at Lisbon in 1568, with an appendix to it, published afterwards.

The opinions of Molina, which were adopted, enlarged, and commented upon by the Jesuits, and strongly opposed by the Dominicans, gave rise to long disputes concerning grace and freewill.

Molina must not be confounded with *Molinos* (*Michael*), a Spanish clergyman of the 17th century, who was the founder of the theory of piety and devotion called Quietism, of which Fénélon was a distinguished supporter.

MOLI'NIA, a genus of grasses belonging to the tribe *Festucineæ*. There is one British species, *M. cærulea*, growing on wet heaths in alpine situations. This species is the *M. depauperata* of Lindley.

MOLLUSCA. [Malacology.]

MO'LOTHRUS, Mr. Swainson's name for a genus of birds placed by him in the subfamily *Icterinæ*, under the family *Sturnidæ*.

Example.—The Cowpen Bird, Cow Blackbird, or Cow Bunting, of the American colonists. (*Molothrus Pecoris*, Swainson; *Icterus Pecoris*, Temminck; *Emberiza Pecoris*, Wilson; *Fringilla Pecoris*, Gmelin.) This species is a native of the American continent, where it leads a wandering life, appearing in the middle and northern States of the Union at the end of March or the beginning of April. The winter is past in the Southern States and warmer parts of the Continent, where the birds are to be seen with the red wings (*Icterus phœniceus*) and the common blackbirds (*Quiscalus versicolor*) in the ploughed fields, according to Nuttall. They attend on the cattle constantly, like many of the *Sturnidæ*, intent on picking up the insects which are disturbed by the quadrupeds or haunt their droppings, nor do they in the colder weather refuse to hunt for aquatic insects and small mollusks on the margins of ponds, where, according to the author last quoted, they may be seen in the winter season industriously turning over the leaves of water-plants to glean such as may there adhere. But though they, with their associates, are occasionally found in the rice and corn-fields, it seems that their depredations are not co-equal with those of their companions, for the food of the cow-bunting appears to consist chiefly of insects and such food as makes them for the most part independent of the farmer.

The most curious of its habits remains to be told; for this vagabond bird, like our cuckoo never prepares a nest for itself, but drops its egg in another's nest. As a concomitant to this ordinance they do not pair, but polygamy prevail among the flock without exciting any great jealousy; though now and then there may be a battle, as is usual in such cases. The egg, which is nearly oval, varies in colour: sometimes the ground-colour is white tinged with green and sprinkled with spots of brown, and sometimes pure white with nearly black spots. It is a very little larger than that of the blue-bird. This supposititious egg is, it appears, always hatched before the legitimate ones. Were this not the course of nature, the species would probably perish; for the legitimate nestlings would suffocate

the newly-hatched foundling, as the latter actually does suffocate the young of its foster-mother, when they afterwards come into existence.

The favourite nests appear to be those of the Red-Eyed and White-Eyed Flycatchers, and the Maryland Yellow-Throat. Those of the Blue-Bird, the Indigo Bird, the Chipping Sparrow, the Song Sparrow, the Blue-Eyed Yellow Warbler, the Blue-Gray Flycatcher, the Golden-Crowned Thrush, and Wilson's Thrush, are however also selected as places of deposit.

MOLSHEIM. [RHIN, BAS.]

MOLTON, SOUTH. [DEVONSHIRE.]

MOLUCCA ISLES constitute a part of the Indian Archipelago, and are situated between 5° N. lat. and 9° S. lat., and between 122° and 131° E. long., being dispersed over the sea which extends from the eastern coast of Celebes to the western coast of Papua, or New Guinea. Nearly all these islands are mountainous, and some of them contain peaks which rise to the height of 7000 or 8000 feet. The rocks of which they are composed seem to be mostly of a volcanic nature, and there are at least eight volcanoes still in action. Like other volcanic countries, the surface of all these islands is very rugged and broken, but their lower parts possess a great degree of fertility, and the coast has many sheltered harbours.

As none of these islands are more than 9 degrees from the equator, the climate is hot all the year round, but the heat is not excessive, on account of their comparatively small size and the uninterrupted continuance of the monsoons for at least ten months of the year.

The agricultural productions do not differ from those of Java, with the exception of rice, which is not cultivated, but imported. The common food of the people is derived from the sago-palms. Fish, wild deer, and hogs are also articles of food. The productions raised for exportation are limited to the clove and nutmeg trees, which are the only two articles that the Moluccas send to Europe. In addition to these articles they send to the markets of China edible birds'-nests, sea-slugs, and shark-fins. A small quantity of gold is also exported, as well as birds of paradise.

These islands, like nearly all those which constitute the Indian Archipelago, are inhabited by two races, the Malays and the Papuas. The Malays are in possession of the coasts, where they cultivate the ground or gain their subsistence by fishing. The Papuas have been extirpated on the smaller islands, but they still maintain their ground in the mountainous districts of the larger islands.

The number of islands probably amounts to some hundreds, of which however many are small and uninhabited. They may be divided into three groups: the Gilolo group, or Proper Moluccas; the Ceram group; and the Timor Laut group. The Gilolo group is the most northern, and extends from 2° S. lat. to 5° N. lat., and contains the islands of Gilolo, Morty, Mandioly, Batchian, Ooby, and Mysole, with numerous smaller islands lying between and about them, among which the islands of Ternate and Tidor are the most important. The Ceram group occupies the middle, between 3° and 5° S. lat., and comprehends the two large islands of Ceram and Booroo, and among the smaller ones, which lie to the south of them, the Spice Islands, or Amboyna and Banda Islands.

The Timor Laut group is the most southern and least known. It consists of the large island of Timor Laut and four others of considerable extent, Larat, Little Key, Great Key, and Key Watcla, with several smaller ones.

History.—When the Portuguese were exploring the eastern seas in the beginning of the 16th century, they arrived at the Moluccas in 1510, and, after a contest with the Spainards, they obtained possession. The Dutch took these islands from the Portuguese about a hundred years afterwards, and established a complete monopoly in the spice trade. In 1796 the British took possession of them, and kept them to the peace of Amiens (1801), when they were restored to the Dutch. The British again took possession of them in 1810, and again gave them up to Holland at the treaty of Paris in 1814. Since that time the Dutch have abandoned some of the smaller establishments, but they still maintain several at Ternate, Tidor, and other places.

MOLYBDE'NUM, a metal discovered by Scheele, in 1778, is a mineral which resembles and had been confounded with plumbago. This metal is obtained as a porous mass or in globules, and has not yet been procured in the state of a button or bar. The grains are somewhat crystalline; sometimes they are of a silver-white colour. When obtained by the reduction of the oxide, this metal has not much lustre, but acquires it by burnishing. Its density is 8.6. When long exposed to the air at ordinary temperatures, it appears to tarnish, but the oxidation is superficial. Oxide of molybdenum occurs encrusting the sulphuret of molybdenum, and also between its laminæ in thin layers. Its structure is thin, fibrous, earthy, friable, and pulverulent. Colour pale yellow or greenish. *Molybdic Acid* also occurs in nature in combination with lead and silver. *Sulphuret of Molybdenum* is the most common mineral of this metal: it occurs both massive and crystalline.

Molybdenum combines with oxygen and with other simple bodies; but its compounds are of little importance.

MOLYN, PIETER. [TEMPESTA.]

MOLYNEUX, WILLIAM, was born at Dublin, 17th April, 1656. He entered the university of that city in 1671, whence, after taking the degree of B.A., he removed to London, and entered the Middle Temple, where he studied law during three years. He subsequently applied himself to the study of mathematics; and in 1683 took an active part in the formation of the Dublin Philosophical Society, of which he was first secretary and afterwards president. In 1685 he was appointed by the English government to inspect the fortresses of the Netherlands, and in the same year was elected a Fellow of the Royal Society of London.

His principal work is a treatise on optics,

entitled 'Dioptrica Nova,' 4to., London, 1692 and 1709, which continued in request for many years. The revisal of the proof sheets was undertaken by Dr. Halley, who added, in an Appendix, his celebrated theorem for finding the foci of optic glasses. He died in Dublin, October 11, 1698.

Besides his 'Dioptrica' and twenty-seven papers on miscellaneous subjects inserted in the 'Philosophical Transactions' between the years 1684 and 1716, he published 'Translation of the Six Metaphysical Dissertations of Descartes, together with the objections against them by Thomas Hobbes,' London, 1671; 'Sciothericum Telescopicum, or a New Contrivance for adapting a Telescope to an Horizontal Dial,' 4to., Dublin, 1686; 'Journal of the Three Months' Campaign of His Majesty in Ireland, with a Diary of the Siege of Limerick,' 4to., 1690.

MOMBAÇA, or MOMBAS, is a town situated on the coast of Zanguebar, and in 4° 4′ S. lat., and 39° 38′ E. long. It is built on the eastern side of an island situated in a bay, which is about 3 miles long by 2 miles broad. The cliffs surrounding the island are steep, and the castle, built on a rock on the south side of the town, was built by the Portuguese in 1635. The town consists of the city and the Black Town, the former of which is inhabited by Arabs and the latter by the free people and slaves. The entire population does not exceed 4000. The commerce, which is mostly in the hands of some Banyans from Hindustan, is inconsiderable. Ivory is the chief export. Vasco de Gama visited the port in 1498; in 1505 it was taken and burnt by Francisco de Almeida; and in 1528 it was again reduced to ashes by Nuño d'Acunha. The Portuguese remained in possession of Mombaça nearly two centuries; in 1720 it came into the possession of the Imam of Muscat; but the inhabitants succeeded in 1824, with the aid of the British, in establishing their independence. The Arabs are governed by a sheik.

MOMENTUM, or MOMENT. This word has been used in several senses. It simply means a motion, the word *momen*, from *movimen*, being found in several ancient authors. *Momentum* was originally one rapid motion, whence it came to be used for a very short time; whence our word *moment*, which, in common life, means an indivisible instant of time. Thus an effect which requires a single second to produce it would not be properly momentary. But the word has passed into mechanics in its original sense of motion, and is used to signify the amount of an effect of motion, actual or conceivable. Thus we have one use in the article VIRTUAL VELOCITIES, another in LEVER, a third in MOMENTUM OF INERTIA, and a fourth, the most common of all, which we proceed to explain in this article.

The English synonym of this fourth sense is 'quantity of motion,' and we may observe that in this sense it is most usual, in our language, to adopt the Latin form *momentum*, instead of the abbreviation *moment*. It is impossible to give an actual definition of momentum, in simple terms; but the conception is obtained by those who observe that the effects produced by *matter* in *motion* (both notions are necessary) may be augmented either by giving the same motion to more matter, or greater motion to the same matter. A heavy blow, for instance, does not mean a blow with a heavy body: thus the fall of a poker may give a light blow, while that of a book of one-tenth part of its weight may give a heavy one. The difference in these cases is that of momentum.

The velocity remaining the same, the momentum or quantity of motion increases with the mass moved; and the mass remaining the same, the momentum increases proportionally to the velocity communicated. But the peculiar proposition on which the utility of the term and the notion depends is this, that in all mechanical effects produced by matter in motion, a diminution of the mass may be compensated by a proportionate increase of the velocity: that is, M being the number of units of mass, and V of velocity, as long as the product of M and V remains the same, the effect produced is the same. Thus 2×100 is equal to 1×200. This product MV is the measure of the momentum, and is generally called the momentum itself.

MOMENTUM or MOMENT of INERTIA. Let us conceive a system of bodies possessing weight, and immoveably attached to a fixed axis, round which the whole system can turn. It is known from experience, as well as deducible from the laws of motion, that the nearer the bodies are placed to the axis, the more rotatory motion may be communicated by a given force. The *moment of inertia* is a name given to a mathematical function of the masses in the system, and of their positions with respect to the axis, on the magnitude of which the rotatory motion produced by a given pressure, acting for a given time, depends. This function is the sum of the products made by multiplying the number of units in each mass by the number of units in the square of its distance from the axis. Thus, if m, m', m'', &c.. be the masses of material points situated at the distance r, r', r'', &c., from the axis, the moment of inertia is $mr^2 + m'r'^2 + m''r''^2 +$ &c.

MOMO'RDICA ELATE'RIUM, or Wild Cucumber, an annual plant, of which the fruit, and more particularly the juice surrounding the seeds, are used in medicine. The juice has an extremely bitter taste, and even in very small quantity acts violently as a hydragogue cathartic, producing numerous watery stools. It owes its power to an acrid and drastic bitter extractive, to which the name of *Elaterin* has been given. This is soluble in alcohol, æther, and fat oils, but scarcely soluble in water or dilute alkalies or acids, while strong acids destroy it.

MOMPAX. [GRANADA, NEW.]

MONA. [ANGLESEY; MAN, ISLE OF.]

MONACHISM. [MONK.]

MONA'CO, *the Principality of*, a small state in the Western Riviera of Genoa. It consists of the small towns of Monaco and Mentone and the village of Roccabruna, with a small territory about five miles in length along the coast, between Nizza and Ventimiglia, and extends inland about three miles. The chief products are oranges, citrons

and other fruits, and oil. The country is rocky, being on the southern slope of the Maritime Alps, which here approach close to the sea. The town of *Monaco*, the ancient *Herculis Monœci Portus*, built on a steep naked rock rising above the sea-coast, is fortified, and has about 2000 inhabitants, and a harbour for small vessels. *Mentone*, farther to the east, lies on the sea-shore in a narrow strip of fertile land, sheltered by the mountains from the north winds, and planted with olive and lemon trees: it has a warm climate, and carries on some trade by sea. Mentone has about 4000 inhabitants, and a handsome church. This little principality has been long in possession of the Genoese family of Grimaldi, and is now under the protection of the King of Sardinia. The revenue of the prince is about 12,000*l*. a year.

MONAGHAN, a county in the province of Ulster in Ireland, is bounded N. by Tyrone, E. by Armagh, S.E. by Louth, S. by Meath, S.W. by Cavan, and W. by Fermanagh. Its greatest length, N. to S., is 37 miles; its greatest breadth, E. to W., is 23 miles. The area is 500 square miles. The population in 1841 was 200,442.

Surface, Geology, and Rivers.—The whole county is hilly, but the hills seem as if scattered in an irregular manner, without forming continued ridges or chains. The principal heights are, Slieve Beagh Mountains, in the north, which define in that part the basin of the Blackwater; and those in the east, which rise about the sources of the Fane, and are connected with the Fews Mountains of Armagh: Mully Ash Hill in this group is 1035 feet high. The Slieve Beagh Mountains form an uninteresting waste along the boundary of this county and Tyrone, and are sterile without being picturesque.

In the southern part of the county is a small district, extending to Kingscourt in the county of Cavan, occupied by the new red-sandstone or red marl. This formation contains a valuable deposit of gypsum; and near this is a small coal-field. Sandstone and carboniferous limestone occupy considerable portions of the county. The rest is occupied by rocks of the transition formation, which cover an extensive district in the east of Ulster and north of Leinster.

Limestone of great variety and excellent quality is quarried; also fine marble, and valuable free-stone for building. A fine white sandstone, dug in the Slieve Beagh Mountains, is extensively used for architectural purposes. Ironstone, slate, and lead-ore, exist in small quantities.

The northern part of the county belongs to the basin of the Blackwater, the southern to the basins of the Fane and the Glyde, and the western to the basin of the Erne. The Lagan flows into the Glyde, and the Finn into the Erne. All these rivers are small. The Ulster Canal passes through this county.

There are several loughs, but all of them small. The principal are, Muckno Lough, near Castleblayney, in the eastern part of the county, and Inner Lough, on the south-west border, near Rockcorry. The Newry and Enniskillen Railway will pass through the county.

Soil; Agriculture; Manufactures.—The soil of the county varies much, but the variation is partly dependent on the character of the surface; the low lands being generally wet and moory, especially in the north-western parts near the Slieve Beagh Mountains. The central districts, comprehending the baronies of Monaghan, Cremorne, and Dartree or Dartry, are more fertile than any other part of the county; although the southern extremity also consists of productive land. The western side has a soil naturally wet, but capable of great improvement by manuring.

Almost the whole county belongs to absentees, and the estates are consequently managed by agents. Farms are not commonly held by lease, and tenancy at will is becoming more common. The farms are almost universally small, and exhibit the system of Irish petty holdings in its fullest extent.

The usual rotation of crops on a small farm is, potatoes, wheat or barley, oats (sown with clover), clover, then potatoes again; another not unusual rotation is, potatoes, flax, wheat or barley, oats with clover. The wheat grown is generally red wheat, and of inferior quality; but the flax crop is important. Clover, vetches, and other green crops, are more attended to than turnips or mangel wurzel.

From the want of good pasturage, no cattle are fattened, except a few on the demesnes of the gentry. A good deal of butter is made, and sent to England. Sheep are very little reared.

The population of the county is very dense; the number of labourers has increased; and the decline of the linen manufacture, which once furnished them with employment, has left the great majority with little other work than that which they bestow on the small spot of land which they occupy. Some of the worst features of Irish poverty and improvidence are to be found in Monaghan.

Divisions and Towns.—Monaghan is divided into 5 baronies. It is in the diocese of Clogher. It is in the North-Eastern Circuit, and the Assizes are held at Monaghan. The county returns 2 members to parliament. The following are the principal towns, with the population of each in 1841:—

Ballybay, or *Ballibay*, 9 miles S. by E. from Monaghan, is a small but thriving town, comparatively well built, and has a neat church and Presbyterian meeting-house. Population, 1768.

Carrickmacross, 23 miles S.S.E. from Monaghan, is a market-town, which has a considerable retail trade with the surrounding populous country. It contains a sessions-house, union workhouse, Roman Catholic chapel, and Presbyterian chapel. Population, 1997.

Castleblayney, 14 miles S.E. from Monaghan, is a regularly built town, with a good market-house, sessions-house, union workhouse, parish church, Roman Catholic chapel, Presbyterian chapel, and Methodist chapel. The surrounding country, especially about Lough Mackno, is very beautiful. Population, 2134.

Clones, a market-town, 13 miles S.W. from Monaghan, on the confines of Fermanagh, has a good retail trade, and contains a parish church,

Roman Catholic chapel, and Methodist chapel. Population, 2877. The Ulster Canal passes within a quarter of a mile of the town.

Monaghan, the county town, is 77 miles N.N.W. from Dublin. The town consists of a central square, and three principal streets diverging from it. It contains a county court-house, county gaol, union workhouse, a handsome new church, and chapels for Roman Catholics, Presbyterians, Methodists, and Independents. It has markets four days in the week for linen, wheat, oats, potatoes, and other produce. The Ulster Canal passes close to the town. Population, 4130.

History.—This portion of Ireland was bestowed on De Courcy by Henry II., in 1177; but from that period till the time of Henry V., the Irish chieftains of the MacMahon family were almost constantly at issue with the English. Little is known of the subsequent condition of the district, or the events that occurred in it, until the reign of Elizabeth, when the MacMahons were finally put down, and their estates confiscated.

MONARCHY, from the Greek *μοναρχία*, a word compounded of *μον,ος*, 'alone,' and the element *αρχ,ω*, 'govern,' and signifying the 'government of a single person.' The word *monarchy* is properly applied to the government of a political community in which one person exercises the sovereign power. In such cases, and in such cases alone, the government is properly styled a monarchy. Examples of monarchy, properly so called, are afforded by nearly all the Oriental governments, both in ancient and modern times. The appellation of *monarch* properly implies the possession of the entire sovereign power by the person to whom it is affixed. The title of *king*, on the other hand, does not imply that the king possesses the entire sovereign power. In a state where the king once was a monarch, the kingly office may cease to confer the undivided sovereignty. States which were at one time governed by kings possessing the entire sovereign power, and in which the king has subsequently been compelled to share the sovereign power with a popular body, are usually styled *mixed monarchies* or *limited monarchies*. These expressions mean that the person invested with the kingly office, having once been a monarch, is so no longer.

Governments are sometimes divided into *monarchies* and *republics;* and therefore all governments which are not monarchies are republics. These definitions of *monarchy* and *republic* however do not agree with existing usage; according to which, the popular, though royal government of England, for example, is a limited monarchy, and not a republic.

MONASTERY. [Monk.]

MONBODDO, JAMES BURNETT, styled LORD (in his quality of one of the judges of the Court of Session), was born in 1714, at the family seat of Monboddo, in Kincardineshire, and, after studying at Aberdeen, was sent to the university of Groningen. He returned home in 1738, and from that time practised as an advocate at the Scottish bar, till his elevation to the bench in 1767. He is known in the literary world by two learned but paradoxical works: the first entitled 'A Dissertation on the Origin and Progress of Language,' in 6 vols. 8vo., 1774-92; the second entitled 'Ancient Metaphysics,' in 6 vols. 4to., 1778, &c. Lord Monboddo died at Edinburgh, May 26, 1799.

MONCHIQUE. [Algarve.]

MONDEGO. [Beyra.]

MONDOVI. [Coni.]

MONESES, a genus of plants belonging to the natural order *Ericaceæ* and the tribe *Pyroleæ*. There is only one species, *M. grandiflora*, which is a native of Europe, Asia, and North America, in Alpine mossy woods. It is found in Great Britain, in the woods of the mountains of Scotland.

MONEY is metal coined for the purposes of commerce, usually stamped with the name and arms of the prince or state that directs it to pass current. In a more enlarged sense, money means any representation of property, whether as coin or in the form of paper—the currency, or circulating medium. For money in this latter sense, and for our monetary system, the reader may refer to such articles as Bank, Bill of Exchange, Coin, Exchange, and Interest.

Our purpose in the present article is to give the values of some of our own coins, and also the values in English money of the principal coins which are in use in those parts of the world with which we are most in habits of intercourse.

Asper, a very small Turkish coin and money of account: 120 aspers = 1 piastre.

Bajoccho, or *Soldo*, a copper coin of Rome, divided into 12 denarii, or 5 quattrini; worth a trifle more than a halfpenny.

Batzen, a base silver coin of Switzerland, and also of some parts of Germany, is worth about $1\frac{1}{2}$ of an English penny.

Carlino, a small Neapolitan silver coin, contains 10 grani, worth 4*d*.

Cash, a small coin in China, and India beyond the Ganges. It is not coined but cast. It is composed of 6 parts of copper and 4 of lead round, marked on one side, and rather raised at the edge, with a square hole in the middle. These pieces are commonly carried like beads on a string or wire. A *tale* in account of fine silver should be worth 1000 cash, or about 6*s*. 8*d*. but, on account of their convenience for common use, their price is sometimes so much raised that only 750 cash are given for the tale.

Cent, or *Centime*, a money of account in France is the hundredth part of the franc; in the United States of America the cent is the hundredth part of a dollar. The Dutch centime is the hundredth part of the florin.

Copeck, see *Kopek*.

Cowries, a species of small sea shells, which are used in the East Indies as money in small payments; 2560 cowries are generally reckoned for a current rupee.

Crore, see *Rupee*.

Crown. In England, Henry VIII. was the first king who coined a crown in gold. Edward VI. was the first who coined the silver crown and half-crown for currency. From Elizabeth to Victoria the silver crown and half-crown ha

been struck in every reign; and are now equivalent to 5*s.* and 2*s.* 6*d.* respectively.

Crusado, a coin in Portugal, both in gold and silver. The value of the gold crusado is 3*s.* 2¼*d.*; of the old silver crusado, 2*s.* 2¾*d.*; and of the new, 2*s.* 3¾*d.* There is also a silver crusado of 1000 reis, worth 4*s.* 10*d.*

Decime, a copper coin of France, equivalent to 2 sous. Ten decimes make the franc, or 100 centimes.

Denier, the 12th part of the French sou.

Dime, an American silver coin, is the 10th part of a dollar, and worth 5½*d.*

Dobra, a Portuguese gold coin, worth 3*l.* 11*s.* 7*d.*

Doit, or *Duyt*, a small Dutch copper coin, the eighth part of a stiver, in value half a farthing.

Dollar. The dollar of the United States, weighing 412½ grains of standard silver, of which one-tenth is alloy, is valued at 4*s.* 4*d.* English. The Spanish dollar is of the sterling value of 4*s.* 4½*d.*; it passes in Spain for 20 reals vellon.

Doppia, an old Sardinian gold coin, worth 32*s.* 6*d.* sterling. The Neapolitan gold doppia, or six ducat piece, is worth 3 farthings more than the English guinea.

Doubloon, a Spanish gold coin equivalent to 4 pistoles. The doubloon of the coinage previous to 1772 was of the value of 3*l.* 7*s.* 7¼*d.*; those coined from 1772 to 1786 were worth 3*l.* 6*s.* 5¼*d.*; those coined since 1786 are equivalent to 3*l.* 4*s.* 6¼*d.* each.

Drachma, a modern Greek coin worth 8½*d.*

Ducat, Dutch, a gold coin, of the value of 5 guilders 2 stivers. English value 8*s.* 9*d.*

Ducat, German, also a gold coin, the rate of coinage of which, although each state has its own ducats, is nearly the same all over Germany, the variations lying between 9*s.* 2*d.* and 9*s.* 5¼*d.*

Ducat, Russian, goes for about 8*s.* 4*d.*

Ducat, Swedish, of gold, of the value of one rix-dollar 46 skillings, of the sterling value of 9*s.* 2¼*d.*

Ducat, the Italian, is a silver coin and money of account at Naples, Venice, and other places, worth about 3*s.* 4*d.*

Eagle and *Double-Eagle*, American gold coins of the value of 5 and 10 dollars respectively. The double-eagle, of the value of 10 dollars, formerly weighed 270 grains, of which one-12th was alloy; since 1837, the double-eagles coined weigh 258 grains, one-10th of which is alloy.

Ecu, a French coin, worth 6 livres or francs.

Florin, a silver coin in Holland, Belgium, and Germany, called also gulden and gülden, and, by corruption, gilder or guilder. The florin of Holland and Bavaria is worth about 1*s.* 8½*d.*; the heavy gulden of Austria is worth about 2*s.*

Florin is also a gold coin of Hanover, worth 6*s.* 11*d.* The Hanoverian silver florin is worth 2*s.* 3½*d.*

Franc, a money of account and silver coin of France and Belgium, of the value of rather more than 9½*d.* It weighs 77.1625 grains, and contains 69.453 grains of pure silver. The French franc and livre were formerly synonymous, but in the coinage of 1795 the franc was made too heavy, and its value was accordingly raised 1¼ per cent.; *thus* 80 *francs*=81 *livres.* A *Swiss franc*, containing 10 batzen, is equal to 1½ French franc, nearly 1*s.* 2*d.*

Francescone, a silver coin in Tuscany, worth 4*s.* 6*d.*

Frederick, or *Frederick d'Or*, a Prussian gold coin, worth 16*s.* 5¼*d.*

Genovina, a gold coin of Genoa, which before 1790 was coined at 100 lire, and was worth 3*l.* 9*s.* 11¾*d.*; since 1790, the Genovina is equivalent to 96 lire, and is worth 3*l.* 2*s.* 6½*d.*

Gilder, see *Florin.*

Grano, a Neapolitan copper coin, worth ⅔*d.*

Groat, an English silver coin, worth 4*d.*

Groschen, Gut (*Good*), a small coin and money of account in Prussia, Hanover, and other parts of Germany. A gut groschen is worth 1½*d.*, a marien-groschen 1$\frac{1}{18}$*d.*

Guilder, see *Florin.*

Guinea, an English gold coin, worth 21*s.*; it weighed 129.324 grains.

Gulden, see *Florin.*

Imperial, a Russian gold coin, of 40 rubles. Those coined before 1763 were worth 2*l.* 1*s.* 6*d.*; those coined since 1763 have passed for about 1*l.* 12*s.* 9*d.*

Kopek, a money of account and copper coin in Russia, of which the ruble contains 100: it is worth nearly two-5ths of the English penny.

Kreutzer, Creutzer, or *Cruitzer*, a German copper coin, and worth ⅓ of a penny; 10 Austrian kreutzers are worth 4*d.*

Lac, see *Rupee.*

Leopoldone, a silver coin of Tuscany, equivalent to the *francescone.*

Liard, a small French copper coin, of the value of 3 deniers.

Lira, a silver coin of Italy, worth about a franc.

Livre, see *Franc.*

Livre-Tournois, an old French coin and money of account, worth a franc.

Louis-d'or, see *Napoleon.*

Madonnina, a silver coin of Genoa. The double madonnina is of the value of 1*s.* 4*d.*

Mark, an old English coin, worth 6*s.* 8*d.*

Maravedi, a Spanish copper coin, 34 of which make a real.

Mark, a silver coin of Hamburg, worth 1*s.* 5¾*d.*

Maximilian, a gold coin of Bavaria, value 13*s.* 7*d.*

Milree, see *Ree.*

Mohur, a coin of gold in the East Indies, equivalent to 15 rupees.

Moidore, an old gold coin of Portugal, of the value of 1*l.* 6*s.* 11¼*d.* sterling.

Napoleon, a French gold coin, the successor of the louis-d'or, of the value of 20 francs. The napoleon weighs 99.564 grains, and contains 89.61 grains of pure gold.

Noble, an old English coin, worth 13*s.* 4*d.*

Paolo, a small silver coin at Florence, Rome, and other places in Italy; its value is 10 bajocchi, or about 5¼*d.*

Para, a small Turkish coin, of the value of three aspers. 40 paras = 1 piastre.

Penny, an English copper coin, of which there are twelve to the shilling.

Pfennig, a Prussian coin, worth one-tenth of an English penny.

Piastre, a Turkish silver coin, of which 95 are now equivalent to one pound sterling; in 1768 it was worth 2*s.* 8*d.* The value of the Roman piastre is about 4*s.* 10*d.*

Pice, a money of account, and a copper coin in the East Indies, the latter a mixture of tin and lead, current at Bombay.

Piece of Eight, the Spanish dollar.

Pistole, a Sardinian gold coin, worth 22*s.* 6¼*d.*

Pistole, a Spanish gold coin, worth 16*s.* 1½*d.*

Quattrino, see *Bajoccho*.

Ree, a Portuguese money of account. The gold milree (or piece of 1000 rees), which was coined for the African colonies in 1755, was of the value of 3*s.* 2½*d.*; but the milree is generally valued at about 5*s.*

Real. There are two small Spanish silver coins called reals—the *real de plata*, worth 5*d.*, and the *real vellon*, worth 2⅔*d.* sterling.

Rix-dollar, a money of account, and coin in Holland, Germany, Denmark, and Sweden; it varies in value from 4*s.* 1¼*d.* to 4*s.* 5½*d.*

Ruble, or *Rouble*, a money of account, and a platinum and silver coin in Russia, worth 3*s.* 2*d.* English.

Rupee, a money of account and silver coin in the East Indies, the current value of which is 2*s.*; 100,000 rupees make a *lac;* 100 lacs make a *crore*.

Schilling, or *Skilling*, also called *shilling* and *escalin*, a money of account, and a copper or base silver coin, in several parts of Germany, worth 12 pfennigs.

Scudo, a money of account and a silver coin in many parts of Italy, in Sicily, and Malta. The scudo of Rome is worth 4*s.* 4*d.*

Sequin, or *Zecchino*, *Italian*, called also *Gigliato*, a gold coin of Venice, Genoa, Rome, Milan, Piedmont, and Tuscany, of the average value of 9*s.* 5*d.*

Sequin, or *Checqueen*, *Turkish;* a gold coin of Turkey, worth about 6*s.* 10¾*d.*

Shilling, English silver coin, equivalent to 12 pence, weighs 87.27 grains, and contains 80.727 grains of pure silver.

Skilling, see *Schilling*.

Sou, or *Sol*, a French copper coin, worth 5 centimes, and nearly equivalent to the English halfpenny.

Sovereign, an English gold coin, worth 20 shillings, weighs 123.274 grains, and contains 113.001 grains of pure gold.

Stiver, a Dutch copper coin, worth a little more than the English penny.

Talaro, an old silver coin of Ragusa, worth 3*s.* 1*d.* The Tuscan talaro is worth 4*s.* 5¼*d.*; the Lombardo-Venetian talaro is worth 4*s.* 2*d.*

Tale, see *Cash*.

Testone, a silver coin of Rome equivalent to 10 paoli, or 100 bajocchi, and worth 4*s.* 3¼*d.* sterling.

Thaler, a German silver coin, the value of which differs slightly in different states: the Prussian thaler is worth about 3*s.*

MONFERRATO, the old name of a district in north Italy, which comprises the country drained by the Tanaro, and extends from the right bank of the Po to the Ligurian Apennines. It gave the title of marquis to an ancient family, descended from the imperial house of Saxony, from the 11th century till the time of Charles V.; when, the male line becoming extinct, the marquisate fell to the Gonzaga of Mantua. On the death of Francesco Gonzaga in 1612, without male issue, the Duke of Savoy claimed the inheritance; this led to a war between the dukes of Savoy and Mantua, in which Spain and France took part, and which was not concluded till the peace of Cherasco in 1630, when the territory in dispute was divided between the dukes of Mantua and Savoy. During the war of the Spanish succession, the Duke of Savoy obtained the whole of Monferrato. This territory is now divided into the provinces of Acqui, Alba, Alessandria, Asti, Casale, and Mondovi.

MONFERRATO. [Acqui.]

MONGE, GASPARD, was born at Beaune, in 1746. His father was an inn-keeper, or hotel-keeper. Of his education little is said, nor is much to be expected, when we find him 'employed at the age of 16, in the college of Lyon, to teach the natural philosophy which he had come there to learn the year before.' The clergy who superintended the establishment used all means of persuasion to induce their young pupil to enter the church, but the construction of a plan of his native town brought him at this time under the notice of a colonel of engineers, who procured for him and persuaded him to accept an appointment in the college of engineers at Mezières, where he remained till 1780, when he was appointed professor-adjoint with Bossut, in teaching hydrodynamics at the Louvre. During his stay at Mezières, observing that all the operations connected with the construction of plans of fortification (such as the French call *défilemens*) were conducted by long arithmetical processes, he substituted a geometrical method, which the commandant at first refused even to look at, so short was the time in which it could be practised; it was however received with avidity when further inspected, and Monge, continuing his investigations, soon generalised the methods employed into that great alphabet of the application of geometry to the arts which is now called descriptive geometry. The method was published by Monge in the well known work 'Géométrie Descriptive' (fourth edition, 1820), which, in simplicity, style, and choice of details in a subject which might easily have been overloaded with them, stands second to no elementary work whatever. Monge was unrivalled in the communication of instruction, and in the interest which he could excite in the minds of his pupils.

In 1780 he was elected of the Academy of Sciences, and in 1783 he succeeded Bezout as examiner of the naval aspirants: he then quitted Mezières entirely, at which place, since his partial removal to Paris, he had hitherto been occupied during half of the year. For his new pupils he wrote his treatise on Statics.

When the wars occasioned by the Revolution were on the point of breaking out, Monge was appointed minister of marine. He quitted this

post without remaining long in it, and became busily engaged in the operations for the equipment of the army. The enormous exertions which were made and the singularity of the crisis are well known. And while the ordinary manufactures were deprived of their materials and of their workmen, all the branches of engineering were also at a stand, from those who could by any process be converted into military men being required for the army. The schools of instruction in these branches had been shut up; and in such a state was the hope of future public officers when, in great part by the exertions of Monge, the Normal and Polytechnic Schools were established: the first for the exigencies of the moment, to accelerate the formation of a supply of good teachers; the second for the permanent means of formation of every department of engineers. Monge himself taught in both.

Monge accompanied the army in the invasion of Italy, and was largely concerned in those wholesale robberies for which restitution was made in 1815. These however must be charged on the general: while to the commission, of which Monge was one, must be allotted the merit of having conveyed the pictures and statues carefully and safely to Paris. Monge also accompanied the expedition to Egypt, and to him, with Berthollet and Fourier, most of the scientific fruit of that undertaking is due, not only as the collectors, but even as the manual defenders of what they had gained. During this expedition a strong friendship grew up between Monge and the future emperor, which made Napoleon a zealous partisan of Monge to the end of his career. The consequence of this attachment was, that Monge was among those who were expelled from the Institute at the final restoration of Louis XVIII. This, and the destruction of the Ecole Polytechnique (since revived), are placed by Dupin among the causes of his death, which took place July 28, 1818.

The science of descriptive geometry, with its numerous applications to the description of machines, to perspective, architecture, fortification, &c., &c., might be explained at length, but not with much profit to the general reader. The analytical discoveries of Monge are hardly less remarkable. He first applied the differential calculus to the general theory of surfaces, in doing which he enlarged the bounds of that science materially, and added many useful theorems, giving to the consideration of the calculus of three variables all that illustration and clearness which his predecessors had, by means of plane geometry, imparted to the less difficult case of two variables. In this field however he had predecessors and rivals; in that of geometry, such as he made it, he had neither the one nor the other. Since the time of Euclid and Archimedes, that science had received no such accession as he furnished.

MONGO'LIA comprehends a vast extent of country in the interior of Asia, between 38° and 53° N. lat. and 84° and 124° E. long. Its length from E. to W. exceeds 1700 miles, and its greatest width from N. to S. 1000 miles. Its area may amount to between 1,200,000 and 1,300,000 square miles. On the N. it borders on Siberia, on the E. on Mandshooria, on the S. on Proper China, and on the Chinese province of Kan-su, and on the Chinese government of Thianshan Pelu.

The middle portion of Mongolia is occupied by the Great Gobi (Ta-Gobi). [GOBI.] South-east of the Gobi extends a more elevated and uneven country, which terminates in a mountain range called Ho-lang Shan. Near 42° N. latitude it turns abruptly to the east, forming nearly a right angle, and it is then called Inshan by the Chinese, and Onghian Oöla by the Mongols; while another portion of it is called Khing-Khan Oöla. Some summits of this extensive range reach a height of 15,000 feet, far above the snow line. The country which skirts this range along its western and northern base, and extends from it to a distance of between 50 and 100 miles, has a broken surface, the hills rising to some height above the valleys and small plains. South of the Inshan Mountains the country exhibits fertile valleys and mountains, partly wooded, as far west as the place where the Hoang-Ho river turns southward: this fertile tract is included in the Chinese provinces of Pe-tche-li and Shan-si. But the tract farther west is covered with hills composed of loose sand, mostly without water and entirely destitute of trees. That part of Mongolia which is to the east of the Khing-Khan Oöla, is called Kortshin. It is mostly a pasture ground, but some portions of it produce good grain.

The country which extends along the north-western side of the Ta-Gobi is nearly unknown, with the exception of the eastern part, traversed by the caravan-road from Kiachta in Siberia to Khalghan in China: this district is very mountainous, and within it rise the rivers Selenga, Kerlon, and Onon. This country, which is rich when compared with other portions of Mongolia, belongs to the high-priest of the Buddhists, who resides in the neighbourhood of the town of Urga, and is called Kootookhtu. It forms a separate government of the Chinese empire, and its general governor, called *vang*, or *kiun-vang*, as well as the lieutenant, called *amban*, resides in the town of Urga, or Oergo. The population of this town does not exceed 7000, of which 5000 are said to be lamas, or persons belonging to the ecclesiastical establishment of the Kootookhtu; but it is a place of considerable traffic.

The western portion of Mongolia, extending from 84° to 96° E. long., between Siberia and the most western extremity of the province of Kan-su, has never been visited by Europeans. It is divided into two governments, the government of Kobdo and that of Uliassutai. The capital of the former is Kobdo, not far from the northern extremity of the lake Yeke Aral Nor: the capital of the latter is Uliassutai, situated on the river Iro, an affluent of the Djabekan. 12

As the whole surface of Mongolia, with the exception of the deep depression of the Ta-Gobi, is more than 3000 feet elevated above the sea-level, and as it stretches out in vast plains, to which the comparatively low ranges of mountains

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along its northern border cannot afford shelter against the northern and north-eastern winds, the climate is much colder than in that part of Siberia which extends along the base of the Altai range west of Lake Baikal.

The wealth of the Mongols consists in their numerous herds of camels, horses, and sheep. Cattle are only numerous on the more hilly tracts. Asses and mules are only found in the vicinity of China. Wild animals are numerous, especially hares, antelopes, djiggetais or wild asses, deer, foxes, sables, squirrels, and marmots. Water-fowl are plentiful on the numerous lakes and swampy tracts. In some places the desert is covered with small stones, among which several kinds of precious stones occur, as chalcedony, agate, onyx, jade, carnelian, &c., which are collected by the Chinese.

Inhabitants.—The inhabitants are called Mongols, and constitute the principal stock of a nation which is widely diffused over the extensive table-lands of central Asia.

This nation is divided into two great divisions, the Eastern or Proper Mongols, and the Western Mongols or Calmucks. [CALMUCKS; TARTARS.] The Proper Mongols are divided into three great nations, the Tshakhar, Khalkhas, and Sunnit, which occupy different districts, but all submitted to the Chinese or Mandshoo power during the 17th century. The whole nation is divided into 26 tribes, called *aïmak*. Each of these divisions has an hereditary prince, except the Khalkhas, who constitute one aïmak, but are governed by four hereditary princes, called *khans*. All four claim a descent from Gengis Khan. The Mandshoos have introduced among them a military division, according to which the whole nation forms 135 banners, each of which is subdivided into regiments and companies. Each Mongol is bound to serve as a horseman from his 18th to his 60th year. All their princes are obliged to pay a fixed tribute as a token of their dependency, but it is small, and they receive ten times its amount back in presents, given to them as a remuneration for their services and fidelity. A few receive even a fixed salary. Some of their princes also are always married to a princess of the imperial blood, and thus are more closely attached to the interests of the emperor.

According to a rough estimate it is thought that this nation can bring into the field 500,000 warriors; and as each male is a warrior, it is presumed that the whole population does not much exceed 2,000,000.

MONGOLS. [MONGOLIA.]

MONIMIA'CEÆ constitute a little-known natural order of plants. The species are very few in number, and in all cases are South American woody plants, shrubs, or trees, with fragrant aromatic secretions. Their real affinity is unsettled. If the prevailing opinion as to their structure is correct, they must be regarded as near allies of *Urticaceæ*.

MONISTROL. [LOIRE, HAUTE.]

MO'NITOR, the name applied by some writers to certain Saurian Reptiles (Lizards) in consequence of the supposed warning they give of the approach or proximity of the crocodile. Under the term *Monitor* Cuvier includes 'Les Monitors proprement dits,' 'Les Dragonnes,' and 'Les Sauvegardes.'

The true Monitors constitute the genus *Varanus* of Merrem (*Tupinambis*, Daud. and Oppel, *Psammosaurus*, Fitzinger, *Hydrosaurus* and *Polydædalus*, Wagler). 'Erpétologie Générale,' vol. iii. p. 467.

These large reptiles have teeth in both jaws, but none in the palate; they are conical and strong. The head is covered with polygonal plates, the skin of the body is beset with numerous scales placed side by side, each encircled by a ring of very small tubercles. The upper aspect of the tail is more or less carinated. There is a fold under the neck before the breast. Femoral pores wanting.

Locality, the Old World. They mostly frequent the borders of rivers, lakes, and marshes, and swim with facility.

Example the Monitor of the Nile (*Varanus Niloticus*, Duméril and Bibron). This species attains to the length of 5 or 6 feet; it is common in the Nile. Its figure occurs on the monuments of the ancient Egyptians, probably on account of its devouring the eggs of the crocodile.

MONK, MONACHISM, MONASTERY.—*Monachism*, as the term implies, properly means a solitary life; but we now usually understand by it the life of persons who are under religious vows, and live in monasteries, abbeys, or nunneries, where the men are called *Monks*, and the women *Nuns*. *Monasteries* (μοναστήρια) are places of residence for persons who have devoted themselves to a religious life.

The history of monasteries and nunneries in Europe, and among those nations which profess Christianity, is part of the history of Christianity, and a very important part of the history of modern civilization. The ascetic practices of some of the early Christians were probably the origin of Monachism. Many persons renounced all the pleasures and business of life, abstained from marriage, and subjected themselves to privation and sufferings, with a view of securing eternal happiness. The founders of the first monastic communities were probably Egyptian Christians, among whom the most distinguished was Pachomius, the disciple of St. Antonius, who himself is considered to be the founder of the monastic or solitary life. After the foundation of the Egyptian monasteries, they extended to other parts of the Roman empire; and in the Eastern church they became the subject of legal regulation, by a constitution of Justinian ('Nov.' 5), addressed to Epiphanius, the archbishop of Constantinople and œcumenic patriarch, in the consulship of Belisarius, A.D. 535.

The institution of monachism had arrived at a state of great corruption both in the Eastern and the Western churches, when St. Benedict arose to reform it, in the latter, in the earlier part of the 6th century. It does not appear however that Benedict, in drawing up what is called his Regula Monachorum, or Rule, had any intention of founding a new order of monks; he writes as if he designed it for the use of all the monasteries then

existing. In point of fact, from the year 530, or 532 according to others, when he established his first monastery at Monte Casino, till after the commencement of the 13th century, when the new mendicant orders made their appearance, the principal monasteries that were founded throughout Europe were of the Benedictine order.

The greatest revolution by which the history of monachism has been marked since the establishment of the rule of St. Benedict, was the rise, in the beginning of the 13th century, of the Mendicant Friars.

The general dissolution of monastic establishments was one of the first consequences of the Reformation in our own and all other countries that separated from the Romish church. There are however a few Protestant monastic establishments in some parts of Germany. Even in some Roman Catholic countries, especially in Germany and France, the number of these establishments has been greatly reduced within the present century and the latter part of the 18th century, and the wealth and power of those that still exist most materially curtailed. The reform of the German monasteries was begun by the Emperor Joseph II.: those of France were all swept away at the commencement of the Revolution; but some of them were set up again, though with diminished splendour, after the restoration of the Bourbons. Since the relaxation of the penal laws, several Roman Catholic nunneries have been erected in England and Scotland, as well as in Ireland.

MONK, GEORGE, *Duke of Albemarle*, second son of Sir Thomas Monk of Petheridge, Devonshire, was born December 6, 1608. His father's estate was much encumbered, and his circumstances so distressed that when Charles I. visited Plymouth Sir Thomas was publicly arrested in the midst of the gentlemen assembled on the king's way. This circumstance had an immediate influence on young Monk's life: he dealt so violently with the under-sheriff, that it became prudent for him to leave England. Sir Richard Greenville, his relative, was on the point of sailing on a cruise, and he embarked with him as a volunteer. Upon the failure of this expedition, he enlisted during the following year in the equally unsuccessful attempt on the Isle of Rhé. Soon after his return he entered the service of Holland. After seeing other service abroad, he fought on the king's side during the civil war. At Nantwich he was defeated by Fairfax (January 1644), was taken prisoner, and, after some delay, confined in the Tower of London. During the two years that he suffered imprisonment, his known abilities made his adhesion desirable to the parliamentary party, and at length, overcome by persuasion and gifts of money (Clarendon, vii. 382), he quitted his prison to serve the parliament. He commanded with success in Ireland and Scotland, and also at sea against the Dutch. Monk, who was (1655) one of the commissioners for the government of Scotland, now stood in a very curious position; for though he was the agent and confident of Cromwell, he was also the hope and favourite of the royalists. After the death of Cromwell he remained at first neutral, but when at length circumstances compelled him to act, he declared for the parliament against the army. He marched his forces to London, where, on his arrival, he was lodged in the apartments of the Prince of Wales. He addressed the parliament, was invited to occupy his place there, was made a member of the council of state, and charged with the executive power. With his usual address, he continued to use the power of his army as a means of awing parliament, and the assertion of duty owed to the parliament as a means of controlling his army. Every day his personal power increased; he was offered the protectorate, which he declined. At length the farce was brought to a close. The king, by Monk's advice, went from Brussels to Breda, and Sir John Greenville, May 1, 1660, returned with letters to the new parliament drawn up as Monk desired, and the king was immediately acknowledged and proclaimed. On the restoration Monk had a grant of money, together with many offices and titles, of which the principal was that of Duke of Albemarle. Monk then resided principally in London, where in 1665 he showed courage and prudence during the prevalence of the plague. He died of dropsy, Jan. 3, 1670.

MONKEY, the name usually applied to those forms among the *Simiadæ* which possess a tail.

MONMOUTH. [Monmouthshire.]

MONMOUTH, DUKE OF. [Charles II.; James II.]

MONMOUTHSHIRE, an English county bordering on South Wales, is bounded N. by Herefordshire, E. by Gloucestershire and the river Wye, S. by the Bristol Channel and the æstuary of the Severn, and W. by a detached portion of Herefordshire, by Brecknockshire, and Glamorganshire. A detached portion of this county is situated N.W. of Monmouth, between that town and Ross. Its greatest length E. to W. is about 34 miles; its greatest breadth N. to S. is about 28 miles. The area is 496 square miles. The population in 1841 was 134,355.

Surface and Rivers. — With the exception of the southern portion, Monmouthshire is generally a hilly country. A chain of mountains occupies the western part of the county between the Usk and Glamorganshire; but the eastern part between the Usk and Wye is comparatively level, and is well wooded. The northern portion of the county is mountainous. The Wye forms the eastern boundary of the county, and flows S.E. and S. past the town of Monmouth to Chepstow, below which it enters the æstuary of the Severn. The Usk enters Monmouthshire from Brecknockshire near the town of Abergavenny, and flows S.E., S., and S.W. through the centre of the county till it enters the Bristol Channel by an æstuary below the town of Newport. The Rumney forms the western boundary of the county, and falls into the Bristol Channel. The Munnow forms the boundary of the county on the N.E., and falls into the Wye below Monmouth. The Ebbw flows through the county from N.N.W. to S.S.E., and falls into the æstuary of the Usk below Newport.

Geology.—The geological formations of Monmouthshire are the old red sandstone east of the Usk, and the coal measures of the South Wales coal field west of the Usk, skirted by a narrow band of carboniferous limestone. In this part of the county iron ore is wrought.

Agriculture.—The soil of Monmouthshire is various, but generally fertile. The agriculture has been a good deal improved of late years. In the north-west a little wheat is grown, but oats and barley are the principal crops. The southern tract bordering on the Bristol Channel is an alluvial soil, which in parts would be overflowed if not protected by great dykes. The cattle are of the Herefordshire breed. The stock of sheep is estimated at about 180,000. There are numerous small orchards.

Divisions and Towns.—Monmouthshire is divided into 6 hundreds. It is chiefly in the diocese of Llandaff. It is in the Oxford Circuit, and the assizes are held at Monmouth. The county returns 2 members to parliament, and 1 member is returned for the Monmouth District.

The following are the chief towns, with the population of each in 1841:—

Abergavenny. [ABERGAVENNY.]

Caerleon, a market-town, 5 miles N. from Newport, stands upon the right or western bank of the Usk. Population, 1174.

Chepstow, a market town, 12 miles S. by E. from Monmouth, is situated on a hill gradually ascending from the Wye, about 2½ miles from the point where that river falls into the æstuary of the Severn. The ruins of Chepstow Castle, which is supposed to have been built in the 11th century, occupy an extensive area in the neighbourhood. Chepstow Bridge, beyond which the Wye is not navigable for large vessels, is a massive structure of iron, erected in 1816. The town has a considerable export and import trade. Population of the parish, 3366.

Monmouth, the county town of Monmouthshire, and a parliamentary and municipal borough, is about 129 miles W.N.W. from London, and 16 miles S. from Hereford. The town is situated between the rivers Munnow and Wye, just above their confluence. Both rivers are crossed by stone bridges. Monmouth is a handsome town, though some of the buildings are antiquated. The town-hall is a commodious building, and the town and county gaol is a massive structure. There are two churches, and several chapels for dissenters. Monmouth has a considerable commerce with Bristol by means of the Wye. There are large iron-foundries in the neighbourhood. The municipal borough is governed by 4 aldermen and 12 councillors. Population of the municipal borough and parish, 5446; of the parliamentary borough of Monmouth, 5822; of the entire parliamentary borough, including the contributory boroughs, Usk and Newport, 24,836.

Newport, a market-town and contributory borough to the Monmouth District, 25 miles S. by E. from Monmouth, and 16 miles W. by S. from Chepstow, is situated on the western bank of the Usk, about 4 miles above its entrance into the Bristol Channel. The river is crossed by a handsome stone bridge, and is navigable for large vessels by means of the flow of tide. Coal and iron are exported in large quantities. The town has been much improved of late years. Shipbuilding is carried on, the river being so situated that vessels of great burthen can be launched from the docks into deep water. The town contains a church and places of worship for dissenters. On the bank of the river at the northern end of the town are the ruins of the castle of Newport. Population of the town, 8225.

Pontypool, a market-town, 9 miles N.W. by N. from Newport, is situated on a steep cliff which overhangs the Avon Llwyd. The town consists of two principal streets, and owes its prosperity to the iron works in the neighbourhood. Most of the inhabitants are employed in the coal mines and iron works. Population of the township, 2865.

Usk, a contributory borough to the Monmouth District, 12 miles S.W. by S. from Monmouth, is situated on the eastern bank of the river Usk, over which is a stone bridge of five arches. The town consists of several streets, in which many of the houses are separated from each other by gardens. It contains a town-hall, prison, church, and places of worship for dissenters. The ruins of an ancient castle stand on an abrupt eminence on the bank of the river. Population of the parish, 2182.

History and Antiquities.—Monmouthshire at the time of the Roman invasion was occupied by the Silures. The Silures remained unmolested by the Romans until England was subdued, and successfully resisted their arms until the reign of Vespasian, when they were conquered by Julius Frontinus. From this time the Romans occupied their country until the year 408. It is a subject of dispute whether Monmouthshire was ever wholly conquered by the Saxons; but they occupied Monmouth, Chepstow, and Caerleon. The Norman kings, after their conquest of England, allowed the barons to make incursions at their own expense, and rewarded them with the gift of the lands which they subdued. Monmouthshire however was not wholly freed from the dominion of the Welsh till a later period of our history. It was not annexed to the Oxford circuit until the reign of Charles II., and remained partly under the authority of the Lords Marchers' court, which was not abolished until 1689.

The principal ecclesiastical antiquities of this country are Tintern Abbey and Llanthony Abbey. The ruins of Tintern Abbey are situated on the right bank of the Wye, about 9 miles below Monmouth. The roof and tower of the building have fallen, but the greater part of the rest remains in tolerable preservation. The Abbey was founded in 1131 for Cistercian monks, by Walter de Clare, and dedicated to St. Mary. Llanthony Abbey stands at the foot of the Black Mountain, in the Vale of Ewias and hundred of Abergavenny. The building is of earlier date than that of Tintern, and in a style of transition from Norman to early English architecture. Only a small portion remains.

MONNOYER, JEAN BAPTISTE, was born at Lille, in 1635. He was educated at Antwerp as an historical painter; and attracted the attention of Le Brun, who employed him in the decoration of the palace of Versailles. He abandoned the historical style at an early age, and devoted his talents to the delineation of flowers. In 1665 he was elected a member of the French Academy of Painting. He came to England to decorate Montague House, (the late British Museum), and obtained great celebrity by the free, graceful, and vivid flower decorations which he scattered about the houses of our nobility. He continued to live in London, and died there in 1699. One of his most remarkable works is a looking-glass in Kensington Palace, painted for Queen Mary. In George II's private chamber at Hampton Court, there are some flower pieces by Baptiste (as he was commonly called). His style is more free, brilliant, and effective, though less highly finished, than that of Van Huysum. His son, Antoine, likewise a good flower-painter, was long known in England as the younger Baptiste.

MONO'CEROS (the Unicorn), a constellation of Hevelius, surrounded by Hydra, Canis Major, Orion, and Canis Minor.

MONOCHORD, an instrument of one string, used by scientific musicians, for the purpose of ascertaining and demonstrating the relative proportions of musical sounds. It is composed of a board, or rule, divided and subdivided into various parts, and of a string distended between two bridges, one of which is placed at each end of the rule. In Dr. Crotch's 'Elements of Musical Composition' will be found a simple and cheap method of constructing a monochord.

MONOCOTY'LEDONS are those plants which are now more commonly called Endogens. [ENDOGENS.] They derive their name from their seed having generally only one cotyledon; but there are exceptions to this, as in wheat, which possesses a second cotyledon in a rudimentary state.

MONOGRAM, a cipher or character formed by an interlacing of letters, and intended as an abbreviation of a name. Monograms were formerly much used, and are not uncommon on Greek and Roman coins. They appear on our Saxon coins, especially those of king Alfred.

MONOMANIA. [INSANITY.]

MONOPOLI. [BARI, TERRA DI.]

MONO'POLY, from the Greek *monopólia* (*μονοπωλία*), which occurs in Aristotle's 'Politick' (i. 11), where it is used simply in the sense of a man buying up the whole of a commodity so as to be the sole holder of it, and to have the power of selling it at his own price. When the word monopolium was used by Tiberius in addressing the Roman senate (Suet. 'Tib.,' c. 71), he thought an apology necessary for introducing a new word. The word however soon came into common use. The term monopoly, which literally signifies *single* or *sole selling*, is used in a constitution of Zeno ('Cod.,' iv. 59) in the sense of forestalling, engrossing, regrating; to which we may add combining to keep up prices. Zeno declares that no person shall exercise a monopoly of clothing, fish, or any other thing adapted for food or use. In the same Constitution he forbids all combination among dealers to raise the prices of any commodity. Zeno's punishment for monopoly was confiscation of the goods of the offender and perpetual exile.

A monopoly, according to the English law, is defined by Coke (3 'Inst.' 181, c. 85, 'Against Monopolists,' &c.) to be 'an institution or allowance by the king, by his grant, commission, or otherwise, to any person or persons, bodies politic or corporate, of or for the sole buying, selling, making, working, or using, of any thing, whereby any person or persons, bodies politic or corporate, are sought to be restrained of any freedom or liberty that they had before, or hindered in their lawful trade.' In 'Le Case de Monopolies' (11 Co., 86, *b*) it is said that every monopoly has three inseparable incidents—the raising of the price, the deterioration of the commodity, and the impoverishment of artificers and others. It appears that these inseparable incidents were considered as tests by which a grant savouring of monopoly might be tried.

Every royal grant or letters patent tending to a monopoly as thus defined and explained was void. The crown however could by letters patent grant and create exclusive privileges of buying and selling when such grant was of general use, or when the grant was to an individual who had introduced into the country something new and useful. This prerogative of the crown was often abused, and by none more than by Elizabeth, who granted many patents of monopolies for the purpose of raising money. As an instance of this, Elizabeth had granted to a certain person the sole making, importing, and selling of playing cards, which grant was declared void by the judges. ('Le Case de Monopolies.')

By the act of 21 Jac. I., c. 3, all monopolies and all commissions, grants, licences, charters, and letters patent to any person or body politic or corporate, of or for the sole buying, selling, making, working, or using of anything, or of any other monopolies, &c., are declared contrary to the laws of the realm and utterly void and of none effect.

By the sixth section of the same statute the above provisions do not extend to letters patent and grants of privilege thereafter to be granted, for fourteen years or under, of the sole working or making of any new manufacture to the true and first inventor thereof, which others at the time of making such letters patent and grants shall not use, so as also such letters patent be not contrary to the law, or mischievous to the state, or generally inconvenient. This section is the foundation of the present law as to patents for inventions.

Copyright and patents are now generally placed among monopolies by legal writers, but not correctly. The original legal sense of the term monopoly has been already explained; and the power of the crown to grant patents is now limited and defined, as well as the several formalities to be observed in obtaining them. Any patent not obtained in due form is void; and the term monopoly, as above explained, has legally ceased to exist.

The vulgar and common use of the term monopoly is incorrect. It merely means that some person or persons in some way, legally, is or are able to command the sole or principal supply of a thing, which can only be done by the possession of superior capital, and by the exercise of superior talent and industry.

MONOTHELITES. [EUTYCHIANS.]

MONOTRE'MES, M. Geoffroy's name for certain edentate mammals of very peculiar organization. Two genera only are known, *Echidna* and *Ornithorhynchus* [ECHIDNA; ORNITHORHYNCHUS.] For anatomical details, see article *Monotremata* in the 'Cyclop. of Anatomy and Physiology.'

MONO'TROPA, a genus of plants belonging to the natural order *Ericaceæ* and the tribe *Monotropeæ*. *M. hypopytis*, Yellow Bird's-Nest, attains a height of 6 or 8 inches. It is a native of Great Britain. This, with the other species of Monotropa, being constantly found at the roots of trees, was supposed to be parasitical upon them; recent researches have, however, led to the conclusion that such an opinion is erroneous.

MONOTROPA'CEÆ are a small natural order of monopetalous exogenous plants, parasitical upon the roots of other species, and covered with brown scales instead of leaves.

MONRO, ALEXANDER, M.D., was born in 1697. He was a pupil of Cheselden, and afterwards studied at Paris, and under Boerhaave at Leyden. In 1718 he returned to Edinburgh, where he was appointed Professor of Anatomy to the Company of Surgeons, and laid the foundation of a school of medicine in Edinburgh, which was soon after attached to the university. In 1759 he resigned the lectureship on anatomy to his son; but he retained his clinical lectureship till within a short time before his death in 1767.

The greater part of Dr. Monro's writings are contained in the Transactions of different scientific societies. The work by which he is chiefly known is his 'Osteology,' which was first published in 1726. His complete works were published by his son, in 1 vol. 4to., in 1781.

MONROE, JAMES, was born in the county of Westmorland, Virginia, on March 16, 1751, of a Scotch family. He entered the army as a volunteer at the age of sixteen, and rose to the rank of colonel. He then went to the college of William and Mary in Virginia, where he studied law; and soon after represented his native county in the legislature; and was also appointed to the council of state. In 1788 he was a member of the Virginia Convention, and was opposed to the adoption of the constitution. He was chosen a senator of the United States by the state of Virginia, and, after continuing in that body about three years, was appointed by General Washington minister to France, whence he was recalled in August 1796. He was elected governor of Virginia in 1798-9. In 1802 he was again appointed minister to France, and, in conjunction with Mr. R. R. Livingston, succeeded in effecting the purchase of Louisiana. From France he went to Spain, and thence to Great Britain, as minister, where, with his adjunct Mr. Pinckney, he concluded a treaty in 1807, which Mr. Jefferson, disapproving, refused to lay before the senate. He was on his return treated with great neglect, but a reconciliation having been brought about, Mr. Monroe was made secretary of state, in which office he continued until he was chosen president, in 1816. After his term of office expired, he lived a short time in Loudon county, in Virginia; but towards the close of his life he removed to New York, where he died July 4, 1831.

MONS, the capital of the Belgian province of Hainault, is situated in 50° 27′ N. lat., 3° 59′ E. long., on the river Trouille, (by which the city is divided into two parts) at a distance of 38 miles by railway S. from Brussels, and has about 30,000 inhabitants. The town is strongly fortified in form of a polygon flanked with fourteen bastions. It is supposed that Mons occupies the site of the Roman station which was so bravely defended by Quintus Cicero against the attacks of the Eburones, the Nervii, and other Gallic tribes. ('Julius Cæsar, De Bell Gall.,' v. 39-52.) Mons is entered by five gates. The streets are for the most part wide, clean, and well paved. The church of St.-Wandru, a remarkable specimen of Gothic architecture, is one of the finest ornaments of the city. There are several other churches in Mons, of which that of St.-Elizabeth is the most remarkable. The other buildings of note in the city are — the town-hall, built in 1440; the tower of the castle, built in 1662; the court-house; the college; the military hospital; the arsenal; and the theatre. Mons has several sugar and salt refineries, soap and starch works, oil-crushing mills, saw-mills, and flour mills. Woollen and cotton manufactures, cutlery, pins, gloves, and small wares, are also made. It is the centre of a very active trade in coals, flax, hemp, grain of various kinds, mill-stones, horses and cattle. The town has communication by railway with all parts of Belgium and France. A canal runs from Mons to Condé, in the French department of Nord; it was made by the French between 1807 and 1814, for the more ready conveyance of coal.

MONSOONS, in French *moussons*, periodical winds which blow over the Indian Ocean, between Africa and Hindustan for nearly 6 months from the north-east, and during an equal period from the south-west. The region of the monsoons lies a little to the north of the northern border of the TRADE-WINDS, and they blow with the greatest force and with most regularity between the eastern coast of Africa and Hindustan. When the sun is in the southern hemisphere a north-east wind, and when it is in the northern hemisphere a south-west wind blows over the sea. The north-east monsoon blows from November to March. It extends one or two degrees south of the equator. It becomes regular near the coasts of Africa sooner than in the middle of the sea, and near the equator sooner than in the vicinity of the coasts of Arabia. This wind brings rain on the eastern coast of Africa. The south-west monsoon does not extend south of the equator, but usually begins a short distance north of it. It blows from the latter end of April to the middle of October. Along the coast of Africa,

appears at the end of March; but along the coast of Malabar, not before the middle of April: it ceases however sooner in the former than in the latter region. The rainy season on the west coast of Hindustan commences with the first approach of the south-west monsoon. The monsoons prevail also on the seas between Australia and China.

MONSTER, an individual in whom one or more of the organs or parts of the body present some congenital malformation, in consequence of which the affected being differs more or less in appearance and internal structure from other animals of the same species or sex.

Monsters were formerly regarded as sports or prodigies of nature, and these ignorant notions, with respect to their true character, continued prevalent among all classes of people until the commencement of the last century, and are even now held by the uninformed. By the physiologist however the study of the various anomalies of organization in man and animals is now viewed as a branch of natural science.

In consequence of the immense number and variety of forms of monstrosity (there being scarcely any part in any species of animal which has not been observed to depart from its usual form and structure), it becomes absolutely necessary to arrange them according to some system.

Monsters may be first divided into simple and compound, the first of which only contain the elements of a single individual, while in compound monsters the constituent parts of two or more beings are united.

Simple Monsters may be again distributed into three classes, which, though not all distinguished from each other by any precise characters, are yet sufficiently distinct for purposes of arrangement.

In the first of these classes may be included those congenital varieties of conformation which are simple and uncomplicated, only affecting one organ or system of organs, and in most cases not interfering greatly with the performance of any vital function.

The second class, on the contrary, contains all those cases in which the degree of malformation is so extensive as to produce great alteration in the anatomical and physiological relations of organs, as well as, in most cases, serious external deformity and disturbance of the vital processes.

The third class may be very clearly defined, for all the malformations which it includes affect one system of organs, namely, those of generation. The monsters in this group are denominated hermaphrodites, the sex being imperfectly developed, and both sexes, or some of their characters, being present in one individual.

An immense number and variety of anomalies are included in the first class, which may be again subdivided into orders, according to whether the malformation affects the size, form, or structure of organs, or produces an alteration in the mode of arrangement and connection, or even in the number of parts. It is often found, however, that two or more of these varieties of malformation exist together in the same monster.

Many curious anomalies in the position and connection of parts have been met with, and it has been observed that organs are subject to changes of position in proportion as they are loosely connected with the surrounding parts at an early period of development.

Together with the alterations of connection, we must place those cases in which, from arrest of development, different organs, naturally entire, are apparently divided into two or more portions, as in Hare-Lip and Spina Bifida.

As arrest of development may produce unnatural separation of parts, so it may also occasion the closure or connection of parts naturally open or separate. Thus we frequently meet with deficiency of one or more of the orifices which open on the surface of the body, and particularly of the anus. In this case the intestinal canal may be perfect, and its orifice only closed by a membranous fold, or it may be very incomplete, and terminate in a cul-de-sac at a greater or less distance from the situation of its natural outlet.

Monsters sometimes present irregularities in the number of parts which they possess, being either furnished with supernumerary organs or exhibiting some deficiency.

The development of supernumerary mammæ is one of the most frequent anomalies of this kind which occur in the human subject. There is commonly only the addition of one extra gland in these cases, making three breasts, but both four and five have been occasionally seen. The bones, muscles, vessels, viscera, and other organs, have all been frequently observed to present alterations in the number of their parts. Many cases are related by authors of an increase or diminution in the number of the cavities of the heart; three ventricles have been met with; absence of both the auricles has been observed; and many anatomists have described hearts which were furnished with only a single auricle and ventricle, as in fishes: cases are even related in which two distinct hearts have been found in the same individual, but their authenticity must be doubted. An unnatural number of teeth has often been observed.

The second class of simple monsters, comprising the various forms of extensive malformation, contains an immense number of different cases. Some monsters, though greatly altered both in form and structure, are yet capable of living for a considerable time after birth; others, on the contrary, are entirely destitute of the power of supporting an independent vitality, and may be so imperfectly formed that the symmetry of the body is lost, and nothing remains but an irregular shapeless mass. Malformation often affects only one region of the body in monsters, the other parts remaining comparatively natural: thus the limbs are frequently very much altered in structure and appearance, and may be even entirely deficient, in cases where the head and trunk preserve almost their regular form. Monsters have been seen in whom the hands or feet were alone developed and inserted immediately upon the trunk. The hands and feet have sometimes been found wanting in cases where the whole or part of the arms and legs were developed, which terminated in a rounded extremity or

stump; and lastly, one or more of the limbs in man and different animals have been found entirely deficient. In another family of monsters, denominated *Symeles* or Sirens, the two thoracic or abdominal limbs are fused together into a single member: thus the two legs have been seen united into one, and furnished with either a double or a single foot, or terminating in a point or stump.

The trunk may be the principal seat of malformation, while the head and limbs only slightly participate in it. In monsters of this kind eventration has generally been found, accompanied with other anomalies. Eventration consists in imperfect development of the walls of the abdomen, and consequently protrusion of the greater part of the viscera, which form a large tumour in front of the abdomen, which is only covered by a thin and delicate membrane, consisting of the dilated base of the umbilical cord.

In both the preceding families of monsters the head is slightly if at all deformed; but many instances have been met with in which the head and face are the parts most extensively altered, though it has been observed, that whenever serious malformation of the cerebral organs takes place, some other parts of the body participate in the anomaly. The brain has often been found imperfectly developed, and situated wholly or partly without the cranial cavity, the walls of which were incomplete.

The last class of simple monsters includes the various forms of hermaphrodism. An hermaphrodite was defined by the ancients as an individual capable of fulfilling by turns the reproductive functions of both sexes, or at least one who simultaneously possessed both the male and female organs fully developed. Such a being however is not only unknown among the authentic details of anomalies, but is physically impossible in man and the higher orders of animals without extensive alteration in the connections of the bones and other parts of the pelvis. The signification of the term hermaphrodism is now much extended, and it is used to designate an individual who possesses any mixture of the characters of the two sexes. An immense variety of these malformations of the generative organs has been observed; but in most cases the malformed being belongs essentially to one or the other sex, and is only related to the opposite sex by some few characters.

Compound Monsters consist of those anomalies in which the parts of two or more distinct beings are united in one individual. The two subjects composing a double being may possess an equal degree of perfection, or be very dissimilar in size and structure, one appearing as a mere parasitical appendage of the other; thus two individuals nearly perfect and distinct may cohere together by one region only of the body, or an apparently single trunk may be furnished with two heads or four arms. The multiplication of one or more of the extremities constitutes in fact the first degree of double monstrosity. In some cases every limb is doubled, and the individual then has eight extremities; in others there is only one supernumerary extremity, which, in some cases, has been observed single at its origin, and doubled or tripled towards its termination, as when two or three feet are attached to the same leg. We have already said that the two subjects composing a double monster may be both nearly perfect and distinct, only adhering together by one region of the body. Beings of this description are sometimes capable of supporting an independent vitality for a considerable number of years, though they are mostly destroyed during parturition, their structure occasioning great difficulty to the process of delivery. One of the most remarkable cases of complete double monstrosity was that of the double female, who was born in Hungary in 1701, and christened by the two names of Helen and Judith.

The junction of two fœtuses may take place by almost any region of the body; thus they have been seen attached to each other by the crown of the head, both being placed in a straight line by the anterior portion of the thorax, or abdomen or by part of the front of both, as occurred in the well-known double monster exhibited in London in 1829–30, and denominated the Siamese Twins.

In some instances of double monstrosity the component individuals are distinct and separate at their lower halves, but more or less intimately united at the upper part of their bodies, so that they appear to have a double body and a single head. In others, on the contrary, there are two distinct heads, and the upper part of the body double, while the pelvis and inferior extremities are nearly or quite single.

Predisposing and exciting Causes of Monstrosity.—Of these little is known; for while the influences determining the phenomena of normal development are hidden from us, those presiding over irregular formation must necessarily be involved in darkness. The organs of the embryo [FŒTUS] are successively developed, and not evolved from originally pre-existing elements: the notion therefore that the germ of the future embryo is ever originally monstrous previous to impregnation must be abandoned, and the causes giving rise to the various forms of congenital malformation must be sought for in some accidental influences disturbing or arresting the process of development in the embryo.

Another very generally admitted cause for some malformations is the occurrence of disease in the fœtus itself, and there is no doubt but that some cases of the malformations of the brain and spinal chord must be referred to dropsical disease occurring in the interior of the skull and spine of the embryo; but in the majority of cases this explanation is inadmissible, and supported by no proofs.

From these observations it will be seen that the forms and varieties which monstrosity presents are apparently under the control of certain fixed laws; or, in other words, there appear to be a number of general facts which are applicable to all cases of malformation.

Monstrosity, however complicated and extensive, is never carried to such a degree as to remove

the animal affected with it out of the series of natural beings in which it has been originally placed; no entire being nor organ has ever been met with so deformed that the species to which it belonged could not be recognised.

Anomalies are more frequent in proportion as they do not affect vital organs nor interfere with any important functions.

The same departures from normal structure occur in plants. [VEGETABLE MORPHOLOGY.] For further information upon the subject of monstrosity the reader may particularly consult Haller's treatise *De Monstris;* Meckel's *Manual of Pathological Anatomy* (German); Geoffroy St. Hilaire's *Anatomie Philosophique;* and Isidore Geoffroy St. Hilaire's *Histoire des Anomalies.*

MONSTRELET, ENGUERRAND DE, a celebrated French chronicle writer, lived in the 15th century. His quotations from Livy, Sallust, and Vegetius, lead to the opinion that he must have had a tolerable acquaintance with Latin literature. M. Dacier supposes that either from bodily weakness, or a taste for study, he altogether abstained from the profession of arms. Most of his life was passed in the city of Cambrai, where he held several offices, being bailiff of the chapter of Cambrai, provost of the city, and bailiff of Wallaincourt. He died in the middle of the year 1453.

The first book of the Chronicles of Monstrelet begins with the year 1400, and ends with the year 1422; the second concludes with 1444. The early editions contain a third and fourth book, which are both rejected by M. Buchon, a modern editor. In 1808 an English version of Monstrelet (including the apocryphal books) was published by Mr. Johnes, the translator of Froissart.

MONT-BRON. [CHARENTE.]

MONT-DE-MARSAN. [LANDES.]

MONT DE PIÉTÉ (MONTE DI PIETA', in Italian), a benevolent institution which originated in Italy in the 15th century, the object of which was to lend money to necessitous people at a moderate interest. Leo X., some say Paul III., sanctioned the first establishment of a Monte di Pietà at Rome, which was under the direction of a society of wealthy persons, who, having contributed the necessary funds, lent upon pledges small sums not exceeding thirty Roman scudi, a little more than six pounds sterling, to each person. Other establishments of a similar nature existed at Milan, Florence, Naples, and most other towns of Italy. That of Padua is one of the oldest on record, having been established in 1491, when the Jewish banks, which lent at usurious interest, were shut up.

This institution was introduced into other countries, especially into the Netherlands, and Monts de Piété were established at Brussels, Antwerp, Ghent, and other places. In Spain there were also similar establishments at Madrid and some other large towns.

MONT-D'OR. [PUY-DE-DÔME.]

MONT-LOUIS. [PYRENE'ES ORIENTALES.]

MONT-ST.-MICHEL. [MANCHE.]

MONTAGNAC. [HE'RAULT.]

MONTAGU, LADY MARY WORTLEY, by birth Lady Mary Pierrepoint, was the eldest daughter of Evelyn, Earl of Kingston (afterwards Marquis of Dorchester, finally Duke of Kingston), by his wife the Lady Mary Fielding, daughter of William, Earl of Denbigh, and was born at her father's seat of Thoresby in Nottinghamshire, about the year 1690. In August, 1712, without the consent of her father, Lady Mary married Edward Wortley Montagu, Esq., eldest son of the Hon. Sydney Montagu, and grandson of the first Earl of Sandwich. Soon after the accession of George I., Mr. Montagu, who had been for some years in parliament, obtained a seat at the Treasury Broad, of which his cousin Charles Montagu, earl of Halifax, had been appointed first commissioner; and from this time Lady Mary resided principally in London, where her wit and beauty immediately acquired her a brilliant reputation. In 1716 Mr. Wortley Montagu was appointed ambassador to the Porte; and in August of that year he set out for Constantinople, accompanied by his wife. They remained abroad till October 1718, and it was during this absence from her native country that Lady Mary addressed to her sister, the Countess of Mar, Mr. Pope, and other male and female friends, the celebrated Letters upon which her fame principally rests.

Lady Mary's visit to Turkey, besides producing the Letters, is famous for having been followed by the introduction, through her means, into this country, and thence into the rest of Europe, of the practice of inoculation for the small-pox. [INOCULATION.] Of the next twenty years of her life, which she passed in England, the most memorable incident is her quarrel with Pope, an affair which is involved in considerable mystery. Her 'Town Eclogues,' have been often printed; others of her poetical pieces, or which have been generally attributed to her, are in so free a style as to make it necessary to exclude them from the modern editions of her works. For reasons, the nature of which is not well known, she again left England in 1739, but this time without her husband, from whom however she seems to have parted on very good terms, although they never met again. She directed her course to Italy, where she lived till 1761, when she was prevailed upon to return to England. She only survived her return to her native country a few months, dying of a cancer in the breast, Aug. 21, 1762.

A collected edition of her works, under the title of 'The Letters and Works of Lady Mary Wortley Montagu,' was prepared and published in 3 vols. 8vo., in 1836, by her great-grandson, Lord Wharncliffe, with an interesting life, and 'Biographical Anecdotes,' by Lady Louisa Stuart, her granddaughter.

MONTAGUE, GEORGE, was descended from an ancient family residing at Lackham, in the central part of Wiltshire. He was one of the early members of the Linnæan Society of London. In 1802 he published an 'Ornithological Dictionary, or Alphabetical Synopsis of British Birds.' In 1802 he produced his 'Testacea Britannica; or Natural History of British Shells, Marine, Land, and Freshwater, including the most minute;

systematically arranged and embellished with Figures;' a 'Supplement' was published in 1809. Besides these two great works he published several papers in the 'Transactions of the Linnean Society.'

During the latter part of his life Mr. Montague lived at Knowle, near Kingsbridge, in Devonshire, where he died in 1815.

MONTAIGNE, MICHEL, SIEUR DE, born in 1533, was a younger son of a nobleman whose estate, from which he took his name, was situated in the province of Perigord, near the river Dordogne. He was taught nothing but Latin in his early years, and spoke that language long before he could speak French. He was also taught Greek. He studied the law, and in 1554 he was made 'conseiller,' or judge, in the parliament of Bordeaux. He repaired several times to court, and enjoyed the favour of Henry II., by whom, or, as some say, by Charles IX., he was made a gentleman of the king's chamber and a knight of the order of St. Michel. Montaigne did not interfere in the political discussions of the day; but lived principally on his estate, from which he derived an income of about 6000 livres. The massacre of St. Bartholomew plunged him into a deep melancholy, for he detested cruelty and the shedding of blood. It was about this dismal epoch of 1572 that he began to write his 'Essais,' which were published in March, 1580, and met with great success.

His 'Journal du Voyage de Michel de Montaigne en Italie, par la Suisse et l'Allemagne, en 1580 1,' which was not published until 1774, is one of the earliest descriptions of Italy written in a modern language.

While he was abroad he was elected mayor of Bordeaux, an honour which he would have declined had not the king, Henry III., insisted upon his accepting the office. During the war of the League, Montaigne had some difficulty in saving his family and property from the violence of the contending factions. He was a partizan of neither; but in 1588 it appears that he was employed in negotiations for a peace between Henri of Navarre and the Duke of Guise. Though he took no active part he showed much political sagacity; he foretold that the dissensions would only cease on the death of one of the great party leaders, and he remarked to De Thou that Henri was inclined to be a Roman Catholic, but was afraid of his own party, while on the other side Guise would not hesitate to embrace Protestantism if he could thereby promote his ambitious views. In September, 1592, Montaigne fell ill of a malignant quinsy, and died on the 13th of that month, in the 60th year of his age.

The 'Essais' have gone through many editions: that of Paris, 3 vols. 4to., 1725, is the most complete. Vernier published, in 1810, 'Notices et Observations pour faciliter la Lecture des Essais de Montaigne,' 2 vols. 8vo., Paris. It is a useful commentary. The best English translation of the 'Essays' is by Charles Cotton, of which an edition, edited by W. Hazlitt, jun., was published in 1842, together with a translation of the 'Diary of a Journey into Italy.'

MONTALEMBERT, MARC-RENÉ, MARQUIS DE, a distinguished military engineer of the 18th century, was born July 16, 1714, at Angoulême. He was descended from an ancient and noble family; and, having received an education in which both literature and science were judiciously conjoined, he entered the army at eighteen years of age.

In the course of his first campaign (in 1733) he was present at the siege of Kehl, and in the following year he distinguished himself at the siege of Philipsburg. He served afterwards with considerable reputation in Bohemia, when a French army under Marshals Broglio and Belleisle was in that country; and, on the retirement of the army from thence, he returned to Paris where he devoted himself to the study of subjects which have relation to the military art. He was admitted a member of the Académie des Sciences in 1747; and he wrote several 'Mémoires,' which were inserted in the volumes published by that body. In 1777 he published a small work entitled 'Correspondence pendant la Guerre de 1757,' which contains much interesting matter relating to that war; and in 1779 he was appointed to construct a fort for the purpose of securing the isle of Aix against the English fleet.

Montalembert published, in 1758, a small work in 4to., entitled 'Mémoire Historique sur la Fonte des Canons;' and, in 1766, one under the title of 'Cheminée-Poêle.' But the work by which his name will be for ever remembered is his great treatise, entitled 'La Fortification Perpendiculaire ou l'Art Defensif supérieur à l'Offensif,' which was published at Paris in 11 4to. volumes (1776 to 1796).

In publishing his great work, and in making his experiments for the improvement of the military art, he seems to have incurred expense which injured his fortune.

Montalembert died of a dropsy, March 29, 1800, being then 86 years of age.

MONTANISTS, or CATAPHRYGIANS, a sect of Christians, which arose in Phrygia about 171 A.D. (Eusebius, 'Chron.,' p. 170; and 'Eccl. Hist.,' v. 3.) They were called Montanists from their leader Montanus, and Cataphrygians, or Phrygians, from the country in which they first appeared.

According to some of the ancient writers Montanus was believed by his followers to be the Paraclete, or Holy Spirit. Probably this is an exaggeration, but it is certain that he claimed divine inspiration for himself and his associates. The doctrines of Montanus agreed in general with those of the Catholic church, but some of his followers appear to have embraced the Sabellian heresy. The Montanists were chiefly distinguished from other Christians by the austerity of their manners, and the strictness of their discipline.

The sect was numerous, and lasted a considerable time. They still existed in the time of Augustin and Jerome, the latter of whom wrote against them.

MONTANUS. [ARIUS MONTANUS.]

MONTAUBAN, capital of the French department of Tarn-et-Garonne, is situated on the Tar

in 44° 1′ N. lat., 1° 21′ E. long., 32 miles N. from Toulouse, and has 23,561 inhabitants. The gates of the town, the only remains of its old fortifications, are of elegant architecture; the streets are well laid out and clean, and the houses, which are of brick, are in general well built. There is a handsome square in the centre of the town. The town-walks, from which there is a fine view of the distant Pyrenees, are very attractive. The public buildings most worthy of notice are—the fine old cathedral, the town-hall, and the bishop's palace. The manufactures are woollen cloth, kerseymere, serge, silk stockings and broad silks, starch, and cards for dressing woollen goods; there are also soap-houses, potteries, brandy distilleries, tan-yards, and dye-houses. The town has a good corn-market, and there are five fairs in the year. The navigation of the Tarn and the Garonne affords ready communication with Bordeaux. The town has a theatre, and a public library of 11,000 volumes. Montauban is the seat of a bishop; it has theological and communal colleges, a theological seminary for Protestants, a tribunal of first instance, and a consultative chamber of manufactures.

MONTBELLIARD. [Doubs.]

MONTBRISSON. [Loire.]

MONTCUQ. [Lot.]

MONTDIDIER. [Somme.]

MONTE SANTO. [Athos.]

MONTECUCULI, RAYMOND, COUNT DE, Prince of Melfi, Knight of the Golden Fleece, and Generalissimo of the Imperial armies, was born at Modena in 1608, of a noble family of that duchy. He entered the service of the house of Austria in the Thirty Years' War; and first signalised his military talents at the head of 2000 horse, by surprising and cutting to pieces a body of 10,000 Swedes, who were engaged in the siege of Numslau, in Silesia, but he was defeated and made prisoner, in 1639, by the Swedes under the celebrated Bannier, near Prague. He remained in prison two years. On his release he was employed in a variety of services till, in 1673, he reached the climax of his fame by being opposed to Turenne, in the war between the Empire and France on the Rhenish frontier, and on the death of Turenne by a chance shot, in 1675, to the great Condé. Montecuculi, claiming no victory, deemed it his highest honour to have encountered without defeat the two greatest French generals of their century. The remaining few years of his life were passed in peace at the Imperial court, and he died in 1680.

Montecuculi had profoundly studied the art of war; and the Memoirs which he composed upon its general principles and practice, as well as upon the peculiarities of warfare against the Turks, and on the operations of the Turkish war of 1661–1664, still retain their value. He was a zealous and generous patron of letters, as well as a great strategist.

MONTÉLIMART. [Drome.]

MONTEM CUSTOM, an ancient custom of a procession of the scholars of Eton school in Buckinghamshire *ad Montem*, which has been abolished within the last few years. It was made every third year on Whit-Tuesday, to a tumulus near the Bath Road, which thence acquired the name of Salt Hill. The chief object of the celebration was to collect money for *salt*, as the phrase was, from all persons present, and it was exacted even from passengers travelling the road. The scholars who collected the money were called salt-bearers, and were dressed in rich fancy habits. This ceremony was frequently honoured with the presence of royalty, and the contributions have been known to amount to upwards of 1000*l*. The sum so collected was given to the senior scholar who was going to Cambridge, for his support at the university.

MONTEN, DIETRICH, was born at Düsseldorf in 1799. He early displayed an inclination for the depiction of battles, and in 1818 he joined the Prussian army for the purpose of observing military operations. He then entered the Düsseldorf Academy of Arts, and afterwards went to Munich to study the works of Peter Hess. He there attracted the attention of the painter Cornelius, and was patronised by the king. He painted three of the frescoes of the Hofgarten Arcade—the principal of which is the storming of the Turkish entrenchments by the Bavarians at Belgrade; the Battle of Saarbrück, for the king, and many other battle-pieces, all conspicuous for fine drawing, good colouring, and spirited execution. He died Dec. 1843.

MONTENE'GRO (*Tschernagora*), a mountainous district, nominally under the protection of Austria, forming part of the high land of Albania, and situated on the borders of Herzegovina, and to the east of the Austrian territory of Cattaro. The country is described as a succession of high rugged limestone ridges diversified here and there by lofty peaks, and in some parts looking 'like a sea of immense waves turned into stone.' Between these ridges high valleys slope down to the south-east, drained by two streams, the Schiniza and the Ricovcernovich, both affluents of the lake of Scutari. The length of this mountainous and little known district is reckoned at about 30 miles from north to south, and about 20 in its greatest breadth from east to west: it is said to contain about 60,000 inhabitants, a fierce Slavish race, which has always maintained its independence against the Turks. They are described as hospitable to strangers, but their habits of savage warfare in their constant border forays with the Turks, in which heads are cut off and exhibited as trophies, prove them to be little less than barbarians. The men are idle and gossiping, except when on their plundering excursions. The women, coarse, muscular, and strong in consequence of their unfeminine occupations, are the 'beasts of burthen' in Montenegro. The Montenegrins belong to the Greek church; they are governed by a Vladika or prince, who is at once a bishop, a judge, a legislator, and commander-in-chief. The office is hereditary in the family of Petrovich; but as every Vladika is consecrated bishop and cannot marry, the succession always falls to a nephew or some other member of the family. The soil of the valleys of Montenegro is not very fertile; it produces fruits and a little

corn, and has good pasturage and abundance of timber. The inhabitants live in villages scattered among the valleys. Cettigne is the capital. (Sir J. Gardner Wilkinson's *Dalmatia* and *Montenegro.*)

MONTEREAU. [Seine-et-Marne.]

MONTESQUIEU, CHARLES DE SECONDAT, BARON DE LA BRÈDE ET DE, was born on Jan. 18, 1689, at the Château de la Brède, in the neighbourhood of Bordeaux. The nobility which Montesquieu inherited was conferred upon his great-grandfather by Henry IV. He attained the rank of Conseiller in the parliament of Bordeaux in 1714, and three years afterwards succeeded at the same time to the fortune of a paternal uncle and to his post of President à Mortier in the same parliament.

With the most assiduous and conscientious discharge of his duties as a judge he united the pursuit of literature. In 1716 he had become a member of the Academy of Bordeaux, and about this time wrote his 'Physical History of the Ancient and Modern World,' which was published in 1719. His classical romance, called 'Le Temple du Gnide,' was published in 1725. In the course of the next year Montesquieu retired from his judicial duties, and devoted himself entirely to literature. He was elected a member of the French Academy, and shortly after set out on an extensive course of travels. On his return to France he spent two years in studious retirement in the country. He published in 1734 his work on the causes of the 'Greatness and Decline of the Romans;' and immediately after he set to work to prepare the 'Esprit des Lois.' He was engaged upon this for fourteen years. Montesquieu did not very long survive the publication. He died in February, 1755.

MONTEUX. [Vaucluse.]

MONTEVIDEO, or SAN FELIPE DE MONTEVIDEO, the capital of the republic of Uruguay, in South America, situated in 34° 55′ S. lat., 56° 10′ W. long., is built on a small promontory, which forms the eastern shore of its harbour, the western consisting of another projecting point connected with a hill, from which the town has received its name. It is 130 miles from Cape Santa Maria, which forms the northern point of the entrance of the La Plata river, and opposite the town the river is still 70 miles wide. Its harbour is more than 4 miles long and more than 2 miles wide, but too shallow for large vessels; it is also exposed to the *pamperos*, or south-western winds, which blow over the extensive plains called *pampas* with exceedingly great force. With all these disadvantages, it is the best harbour on the broad æstuary of the La Plata. The town is in general well built, the streets being wide, straight, and intersecting each other at right angles: they are paved, and have narrow footways. The houses are built with taste, and have flat roofs and parapets. The cathedral is not distinguished by its architecture, nor are there any other public buildings of note. Montevideo is a very healthy place, but suffers from want of wood and water. The population, which, before 1810, amounted to 36,000, has been reduced by almost constant warfare with Buenos Ayres to less than half that number. The principal articles of export are hides, salted and jerked beef, tallow, and horns.

MONTEZUMA. [Mexico.]

MONTFAUCON, BERNARD DE, a Benedictine of the congregation of St. Maur, was born January 17th, 1655, at Soulage in Languedoc. He was the son of Timoleon de Montfaucon, Lord of Roquetaillade and Conillac. His first profession was military, and he served in Germany under Marshal Turenne; but at the age of 20, in 1675, he entered the learned congregation of St. Maur.

His edition of Athanasius, in Greek and Latin, 3 vols. folio, established his reputation as a profound scholar. He made a journey to Italy for the purpose of consulting the manuscripts in the Italian libraries. In this pursuit he passed three years, and upon his return in 1702, published an account of his journey and researches in his 'Diarium Italicum.' Among the works of this eminent scholar, one, the best known, is his great work, entitled 'L'Antiquité Expliquée et Representée en Figures,' Paris, 5 vols. fol., to which, in 1724, was added a Supplement in 5 vols. Montfaucon died suddenly at the abbey of St. Germain des Prés, December 21, 1741. He contributed many valuable essays on subjects of antiquity to the Memoirs of the Academy of Inscriptions and Belles-Lettres, as well as to other literary journals.

MONTFERRAND. [Clermont.]

MONTFLANQUIN. [Lot-et-Garonne.]

MONTFORT, SIMON DE. [Henry III.]

MONTGOLFIER. [Balloon.]

MONTGOMERY. [Montgomeryshire.]

MONTGOMERY, ALEXANDER, was of a good family in Ayrshire. He is described as being a captain, probably in the guard of Morton the regent. In 1607 his principal work, 'The Cherry and the Slae' (sloe), was published. He appears to have died about 1611. In 1822 Mr. Laing edited a complete edition of his works.

MONTGOMERYSHIRE, a county of North Wales, bounded N. by Denbighshire, E. and S.E. by Shropshire, S. by Radnorshire, S.W. by Cardiganshire, and W. and N.W. by Merionethshire. Its length from N.E. to S.W. varies from 23 to 40 miles; its breadth from 19 to 33 miles. The area is 839 square miles. The population in 1841 was 69,219.

Surface and Geology.—Montgomeryshire is entirely an inland county, and belongs wholly to the mountainous tract of Wales. The north-western border toward Merionethshire is occupied by the Berwyn Mountains, and when these form two branches inclosing the valley of the Dovey, the south-eastern branch belongs in great degree to Montgomeryshire. It separates the basin of the Dovey from that of the Severn. The south-eastern border is occupied by the heights which extend from the neighbourhood of Shrewsbury across Clun Forest to Rhayader in Radnorshire. Irregular branches from these two principal chains occupy the intermediate part of the county. Plinlimmon belongs to the Berwyn chain, and is partly in this county, but its summit (2463 feet) is just within the border of Cardiganshire.

The county is almost entirely occupied by the slate rocks which overspread so large a portion of Wales, but granite, greenstone, conglomerate, and the new red-sandstone also occur in different places. The mineral treasures are not very abundant. Lead and zinc are procured, and also some copper and zinc.

Rivers.—The Severn is the principal river of the county; it rises just within the border towards Cardiganshire, on the eastern side of Plinlimmon, and flows E. about 12 miles to Llanidloes, whence it flows N.E. about 38 miles to the junction of the Vyrnwy on the border of the county, a little below which it quits the border to enter Shropshire. The Severn receives the Tirannon, 12 miles long, the Afon Garno, 12 miles long, the Mule, 11 miles long, the Rhiw, 18 miles long, and the Camlet, 20 miles long. That part of the course of the Severn which lies in Montgomeryshire or on the border is about 51 miles. The Vyrnwy receives a number of small streams, and flowing S.E. passes Llanfair; it then turns N.E., and after receiving the Tanat and other smaller streams, joins the Severn near the borders of Shropshire; its whole course is about 45 miles. The southern part of the county is watered by the Wye, an important tributary of the Severn, which rises on the south-east side of Plinlimmon near the source of the Severn, and flows S.E. 14 miles into Radnorshire. The Dovey chiefly belongs to Merionethshire. It enters Montgomeryshire about 4 miles below Dinas-y-Mowddy, and flows about 10 miles to the neighbourhood of Machynlleth, where it again touches Merionethshire. Its remaining course is between Merionethshire, Montgomeryshire, and Cardiganshire. Of these rivers only the Severn and the Dovey are navigable in that part which belongs to this county. The Montgomery Canal passes through the county.

Divisions and Towns.—Montgomery is divided into 9 hundreds. The greater portion of the county is in the diocese of St. Asaph: the remainder in those of Hereford and St. David's. It is in the North Wales circuit. The assizes are held in the spring at Welsh Pool, and in the winter at Newtown. The county returns one member to parliament; and Montgomery, with its contributory boroughs, Llanidloes, Llanfyllin, Machynlleth, Newtown, and Welsh Pool, returns one member.

The following are the chief towns, with the population of each in 1841:—

Llanfair, or Lladvair Caer Einion, is near the centre of the county about 11 miles N.W. from Montgomery. The town is on a rising ground on the south bank of the Vyrnwy. It is neatly built. There is a neat and commodious town-hall, with a market-house underneath. The church is an ancient building. Population of the parish, 2747.

Llanidloes, a market-town and contributory borough, 20 miles S.W. from Montgomery, stands in a pleasant vale on the S.E. bank of the Severn. Llanidloes consists of two principal streets crossing each other at right angles, and of some inferior ones. There are two bridges over the Severn, one of which is a handsome stone bridge of three arches. The town-house is a massy building framed with timber, and the intervals filled up with lath and plaster. The church is remarkable for its old oak carvings. The chief manufacture of the place is flannel, which gives employment to a considerable number of the inhabitants. Population of the parish, 4261; of the contributory borough, 2742.

Llanfyllin, or Llanvyllin, a market-town and contributory borough, 16 miles N.W. by N. from Montgomery, stands in a pleasant valley watered by the Cain, an affluent of the Vyrnwy. The town is on the south bank of the Cain, and is very small. There is a town-hall, with a covered area for a market underneath, on one side of the principal street. The church is a brick building erected early in the last century. Population of the parish, 1955; of the contributory borough, 1106.

Machynlleth, a market-town and contributory borough, is about 33 miles W. from Montgomery. The town is situated near the confluence of the Dulas with the Dovey. It is neatly and regularly built, and consists of two principal streets. There is a town-hall and market-house, a plain building. The church, rebuilt, with the exception of the tower, in the present century, is tolerably large. The river Dovey is navigable to within two miles of the town, and affords facilities for the export of oak-bark and timber, and the import of corn and other articles. Population of the town and liberties, 1636; of the contributory borough, 1672.

Montgomery, the county town, and a parliamentary borough, is about 168 miles N.W. by W. from London. The town stands partly on the slope and partly on the summit of a hill, which is commanded by a much loftier elevation in the immediate neighbourhood. It consists of four principal streets, which meet in the market-place in the centre of the town. The houses are well-built. The market is well supplied with corn and provisions of all kinds. There are some ruins of the castle, which stood on a steep projecting eminence on the north side of the town. The castle appears to have been enclosed by four ditches, cut in the solid rock, and crossed by drawbridges. The church is an ancient cruciform building, not very large, in the early English style, with a tower erected in the course of the present century. The town-hall is a brick building, with a market-house underneath. Population of the borough and parish, 1208; of the parliamentary borough, 1176; of the parliamentary borough, including the contributory boroughs, 17,901.

Newtown (in Welsh, Tre Newydd), a contributory borough, is 9 miles S.W. from Montgomery. It is situated in a valley on the right or south bank of the Severn, over which there is a stone bridge of three arches. The older houses are usually of timber and brick, but the houses of later erection are of more respectable appearance. The market-hall, a plain building, stands in the midst of the principal street. The church is an ancient structure, of little architectural pretensions. The Montgomery Canal commences at this town,

where there is a large basin. Population of the parish, 3226; of the contributory borough, 6535.

Welsh Pool (so called to distinguish it from Poole in Dorsetshire), a market-town and contributory borough, is about 9 miles N. by W. from Montgomery. The town stands near the left or west bank of the Severn, in a hollow opening upon that river, and watered by two brooks which flow into the Severn. It consists of two parts, Pool Town and Welsh Town. The houses are chiefly of brick, respectable, and built with regularity. The town-hall is in the centre of the principal street. The church is spacious and handsome. The Montgomery Canal passes close to the town, and the navigation of the Severn begins here. Population of the contributory borough, 4670; of the town, 6185.

History and Antiquities. — Montgomeryshire was, with the neighbouring counties, included, during the period of British independence, in the territory of the Ordovices, and on the reduction of the island under the Roman power, in the province of Britannia Secunda. After the withdrawal of the Romans we hear nothing of this county for many years. In the year 894, in the reign of Alfred, the Danes entered the county. Hastings, or Hasten, or Hesten, their leader, had invaded the eastern parts of England; and in his third campaign, A.D. 894 or 895, he entrenched himself at Buttington, on the east bank of the Severn, close to Welsh Pool. There he was besieged by Alfred's thanes, until, reduced to desperation by famine, he broke through the blockading force, and with fearful loss returned to his former quarters on the east side of the island. A portion of the eastern part of the county, cut off by Offa's Dyke, was included in the territory of the Saxons. The rest was included in Powys, or Powysland. After the Conquest, Powys became the continual object of attack by the Norman lords of the marches or frontiers. These hostilities led to the erection of the castles of Montgomery by the Normans, and Powys, near Welsh Pool, by the Welsh, and to a continued and severe struggle for the possession of these strongholds. The independence of Powys was overthrown before the final subjugation of North Wales: it was constituted an English lordship, which became extinct in the reign of Henry VIII. The only remaining castles, or ruins of castles, are those of Montgomery and Powys. There are no monastic ruins of any consequence in the county.

MONTH. [MOON; YEAR.]

MONTI, VINCENZO, born in 1753, studied at Ferrara under the poet Minzoni. In Rome he was introduced to Don Luigi Braschi, the nephew of the then reigning Pope Pius VI., and was retained by that nobleman as his secretary. Monti wrote verses, and was admitted into the Academy of the Arcadians. In 1786 he wrote his tragedy of 'Aristodemo,' which established his literary reputation. After he had produced several minor works, the tragical death of Hugo de Basseville, the agent of the French republic, in January, 1793, suggested to Monti the idea of a poem in terza rima, which he entitled the 'Basvilliana.' This poem had an astonishing success: eighteen editions of it appeared in the course of six months. It is still considered as Monti's best work.

When the French armies invaded North Italy and occupied Ferrara, the poet left Rome and repaired to Milan, the capital of the new Cisalpine Republic. Here he was in a new atmosphere, and he wrote in favour of republics and revolutions. At the epoch of Suwarrow's invasion of Italy in 1799, Monti took refuge in France, from whence he returned after the battle of Marengo. Amongst the poems written after his return was his 'Cantica,' on the death of his friend Mascheroni, a man of science and letters, who had died in France, in exile, in 1799. Monti's drama called 'Caio Gracco' contains some impressive scenes, but the play is altogether inferior to the 'Aristodemo.' His third tragedy 'Galeotto Manfredi,' founded upon an incident of the Italian middle ages, is still weaker.

In 1805, Napoleon, having made himself king of Italy, appointed Monti to be historiographer of the new kingdom. The poet, instead of history, wrote verses; and in 1806 he published six cantos of a poem in praise of Napoleon, which he entitled 'Il Bardo della Selva Nera.' He did not remain unrewarded for this and other flatteries; and he enjoyed his honours till 1814, when, on the re-establishment of the Austrian power, he sang the praises of the 'just and pacific government of Francis,' in two short dramatic pieces.

After the marriage of his only daughter with Count Perticari of Pesaro, both father and son-in-law engaged in a philological work, entitled 'Proposta di alcune Correzioni ed Aggiunte al Dizionario della Crusca,' which became the signal of a paper war between the Tuscan and the Lombard literati, or rather between the ultras of both parties, the Crusca and the Anti-Crusca. Monti was a classicist, and waged war against the 'Romantici,' as they are called, or that school of writers who have undertaken to modernise the literature of Italy. He died at Milan, in October 1828. His works were published at Bologna, in 8 vols. 12mo., 1828; and another edition of select works, including some inedited ones, in 5 vols 8vo., Milan, 1832.

MONTIA, a genus of plants named in honour of Dr. Joseph Monti, professor of botany and prefect of the medical garden at Bologna. The genus *Montia* belongs to the natural order *Portulaceæ*. There is only one species of this genus, *M. fontana*, which is a native of Great Britain. It is also found in North and South America in bogs, ponds, and ditches; and is known by the name of Water-Chickweed.

MONTIGNAC. [DORDOGNE.]

MONTLUÇON, pop. 5760. [ALLIER.]

MONTMARTRE. [PARIS; SEINE.]

MONTMEDY. [MEUSE.]

MONTMIRAIL. [MARNE.]

MONTMORENCY. [SEINE-ET-OISE.]

MONTMORILLON. [VIENNE.]

MONTOIR. [LOIR-ET-CHER.]

MONTORSOLI, FRA GIOVANN' ANGELO was born in 1507 at Montorsoli near Florence. He received the rudiments of his artistic educatio

from Andrea da Fiesole; and first became known as the assistant of Michel Angelo in the church of San Lorenzo at Florence. In 1530 he became a friar of the order of the Servi della Nunziata, at Florence. His many engagements however drew him from the abode of his order, and we hear of him as the restorer of the Laocoon and the Apollo, and as engaged upon the sculpture of the library of San Lorenzo: his finest work there is San Cosimo. He assisted Michel Angelo in the monument of Julius II. at Rome; constructed the tomb of Jacopo Sannazaro at Naples; completed the statue of Andrea Doria at Genoa; constructed the grand fountain in front of the Cathedral of Messina, and designed the church of San Lorenzo, with many other public buildings in that city; built the high altar of the church of his own order at Bologna; and being rich he built a common sepulchre for artists in the chapter-house of the convent of the Nunziata at Florence, on the completion of which Duke Cosmo I. restored and consolidated the almost decayed Society of St. Luke, which is now known as the Academy of Florence. Montorsoli died August 31, 1563.

MONTPELLIER, capital of the French department of Hérault, is situated on a hill near the Lez, in 43° 36′ N. lat., 3° 52½′ E. long., at a distance of 30 miles by railway S.W. from Nîmes, 20 N.W. from Cette, its port, and has 40,746 inhabitants. Montpellier was built in the 10th century to replace the episcopal town of Maguelone, which stood on an island in a neighbouring lake, and had been destroyed by order of Charles Martel for favouring the Saracens. It is situated on an eminence, from which there is an extensive view over the Mediterranean and the adjacent coasts. Except some of the gates and the citadel, there are few remains of the old fortifications. The citadel is of little strength; it is however well kept up, and has a good parade. The streets are narrow, crooked, and steep; but the houses, which are almost all of stone, are substantially built. Most of the squares are small and of irregular form; the public fountains are numerous. There are two town-walks, the esplanade between the town and the citadel, and the Peyrou, a terrace-walk planted with trees and covered with turf. On the upper part of the terrace there is an hexagonal tower adorned with columns, and inclosing a reservoir, which is supplied with water by an aqueduct about 5 miles long. The water from this reservoir falls in a cascade over artificial rocks, and supplies the various fountains of the city. The cathedral presents little that is worthy of notice. The former amphitheatre of St.-Côme, now the Exchange, is adorned with a handsome Corinthian portico, and is perhaps the handsomest building in the city. The modern anatomical theatre is a fine building, and the gate of Peyrou, a triumphal arch opening on the promenade of Peyrou, is also handsome; but the former episcopal palace, now occupied as a medical school, the court-house, the prefect's house, &c., are of ordinary appearance.

The manufactures of Montpellier are considerable, and trade is prosecuted on a large scale. There are several banking-houses. Liqueurs, perfumery, preserves, dried fruits, verdigris, alum, cream of tartar, vitriol and aquafortis, woollen cloth, muslins, printed cottons, calicoes, table linen, blankets, hosiery, hats, leather, corks, and paper, are manufactured; these articles, with wool, wine, brandy, oranges, citrons and other fruits, and the oil of the surrounding districts, furnish the chief articles of trade. There are several printing-offices, sugar-refineries, potteries, oil-mills, paper-mills, and saw-mills. In the central prison, which receives convicts from 20 departments, several articles of silk and cotton are manufactured.

Montpellier is the seat of a bishop, whose diocese comprehends the department of Hérault. It has a High Court and University-Academy, which have jurisdiction over the departments of Aude, Aveyron, Hérault, and Pyrénées-Orientales; there are also a tribunal of first instance, chamber of commerce, an exchange, an eminent medical school, a college, a theological school, a splendid picture gallery and library called the Musée Fabre, a Protestant church, a synagogue, several hospitals, barracks for 2000 soldiers, a Mont-de-Piété, a botanic garden, and many scientific and educational institutions. Montpellier is the head-quarters of the 9th Military Division, which comprehends the departments of Ardèche, Gard, Lozère, Hérault, and Aveyron. Montpellier offers many attractions to strangers, besides the beauty of its situation. The air is purer and less scorching and stifling than at Marseille; mosquitos are less troublesome; and the keen blasts of the Mistral are less felt.

MONTREAL, the capital of Lower Canada and the seat of the United Legislature of the two Canadian provinces, is situated on the south side of the island of Montreal, in 45° 31′ N. lat., 73° 34′ W. long., and has about 50,000 inhabitants. It was founded in 1640, under the name of Ville-Marie, on the site of Hochelaga, an Indian village. The streets are wide; the houses well built, large, and commodious. Rue Notre-Dame is the principal street, and contains the town-hall, a large building; the seminary of St.-Sulpice, and the convent of Notre-Dame. The Roman Catholic cathedral, one of the largest churches in America, capable of containing 10,000 persons; the general hospital, the theatre, the barracks, and the new prison, are conspicuous structures. The city, which is the seat of the governor of Canada and of a Roman Catholic bishop, has a French college, a university, founded in 1821, a Roman Catholic theological school, and several classical and scientific academies. The parliament house and the library attached to it, were entirely destroyed by fire in the political riots of April 26, 1849. The harbour, which is formed by an arm of the St.-Lawrence, is small but secure; the difficulty of approach, which the rapid of St.-Mary formerly presented to sailing vessels, has been overcome by the employment of steam-tugs. The shipping trade of Montreal is very active whilst the navigation is open. The tonnage that entered and cleared from the port in 1847, was 62,238 tons, in 221 vessels. The repeal of the Navigation Laws and the uninterrupted steam navigation by the Rideau and Welland Canals and the great

lakes westwards, as far as Chicago on the south-western shore of Lake Michigan, whereby the produce of Illinois and the western states will find a ready vent to Europe, promises to add greatly to the trade of Montreal. Steamers ply regularly during the season to Quebec.

MONTRÉAL. [AUDE.]

MONTREJEAN. [GARONNE, HAUTE.]

MONTREUIL-SOUS-BOIS. [SEINE.]

MONTREUIL-SUR-MER. [PAS-DE-CALAIS.]

MONTRICHARD. [LOIR-ET-CHER.]

MONTROSE. [FORFARSHIRE.]

MONTROSE, JAMES GRAHAM, MARQUIS OF, born 1612, was descended from one of the most ancient families in Scotland. He married at an early age, and then went on foreign travel till about 1633, when, at the age of twenty-one, he returned to Scotland. He first of all attached himself to the popular party, and assisted in the preparation of the National Covenant. Conceiving himself however slighted by that party, Montrose determined on going over to the king. A secret correspondence with Charles I. being detected, the Covenanters threw him into prison, whence he was set at liberty with his adherents in the beginning of 1642. In April 1644 he was created Marquis (he had previously been Earl) of Montrose, and constituted captain-general and commander-in-chief of all the forces to be raised in Scotland for the king's service under Prince Rupert. Though unsuccessful at first, he afterwards achieved a series of brilliant victories. The last of the series was the battle of Kilsyth, fought August 1645. Montrose then advanced towards the borders, presuming on the continued success of his arms. He was however mistaken: at Philiphaugh, near Selkirk, he was surprised by General Lesly on Sept. 13, 1645, and a fearful retaliation was that day inflicted. Montrose regained the Highlands with a few followers; and, on the king's surrender to the Scots, Montrose capitulated, and was permitted to embark in a small vessel for Norway, Sept. 3, 1646.

He remained abroad till the death of Charles I., when he received a commission from the exiled prince for a new invasion of his native country. Accordingly, selecting the remote islands of Orkney for his rendezvous, he despatched thither a part of his troops, consisting of foreign auxiliaries, in September 1649; and, in March following, he himself arrived there. In his first encounter with the enemy however on the mainland, his forces were utterly routed. He escaped to the house of McLeod of Assynt, by whom he was delivered up to General Lesly, and was then conducted to Edinburgh, where he received sentence of death; and on Tuesday, May 21, 1650, he was hanged.

MONTROUGE. [SEINE.]

MONTSERRAT, one of the Leeward islands and a dependency of the island of Antigua, about 22 miles S.W. from Antigua, and the same distance N.W. of Guadaloupe, is about 12 miles long, and 7 broad. The population in 1844 was 7365. In that year the island exported 1103 hogsheads of sugar, 75 puncheons of molasses, and 60 puncheons of rum; in 1845 the exports were 777 hogsheads of sugar, 316 puncheons of molasses, and 36 puncheons of rum. The island is of volcanic origin; the mountains are in many places quite inaccessible, and separated from each other by almost perpendicular chasms, which, with the sides of the mountains, to their summits, are clothed with a luxurious vegetation, including both lofty trees and tropical shrubs. On the south-west side, at a height of 1000 feet from the level of the sea, there is a boiling sulphurous spring. The town of *Plymouth*, situated on the south-west side of the island, is small, but well built. The shipping lies off the town in an open roadstead. There is indeed no harbour or bay on any part of the shore, and it is hazardous for ships to remain at the island during the hurricane months.

MONTSERRAT. [CATALUÑA.]

MONTUCLA, JEAN ÉTIENNE, was the son of a merchant at Lyon, in which city he was born, Sept. 5, 1725, and educated.

From Lyon he went to Toulouse, in order to qualify himself for the legal profession, and, having taken the usual degrees, he thence proceeded to Paris.

At the public libraries of that metropolis, and at the scientific soirées of M. Jombert, he made the acquaintance of Diderot, D'Alembert, Cochin, Lalande, and others. In 1754 he published in 12mo., anonymously, the 'History of the Researches for determining the Quadrature of the Circle,' to which was appended 'An Account of the Problems of the Duplication of the Cube, and the Trisection of an Angle.' A second edition of this work appeared in 1831, in 8vo., edited by Lacroix. The following year (1755) he was admitted a member of the Academy of Berlin; and in 1758 he published, in 2 vols. 4to., the first part of the 'History of the Mathematics.' After this he began to be employed by the government. His leisure was devoted to the education of his family and to scientific pursuits, but the latter he is said to have conducted with extreme secrecy; lest he should be suspected of neglecting his official duties. In this way he edited, in 1778, a new and greatly improved edition of Ozanam's 'Mathematical Recreations,' in 4 vols. 8vo., and so carefully had he concealed his connection with the work, that a copy was forwarded to him, in his capacity of censor royal of mathematical books, for examination and approval. The income he derived from his situation under the government, though small, was sufficient for the immediate wants of himself and family, but by the events of the Revolution he lost his situation, and was left little short of destitute.

In 1794 he was employed in forming an analysis of the treaties deposited in the archives of the foreign department, and about the same time he was nominated professor of mathematics to one of the central schools of Paris, but his health not permitting him to fill the appointment a situation in the 'Jurés d'Instruction' was assigned to him. In 1798 he published a second edition of the first part of his 'History of the

Mathematics,' in which he introduced many improvements and augmentations. With the exception however of the profits, if any, which he may have derived from this work, his only resource for two years, from which he could provide for his family, was an insignificant situation in the office of the National Lottery. Upon the death of Saussure, in 1799, the minister Neufchâteau conferred upon him a pension of 2400 francs, which he lived but four months to enjoy. He died on the 18th of December, 1799. His modesty and benevolence were no less conspicuous than his erudition and the smallness of his fortune. When Lalande, deputed by the Academy, offered him some situation in that society, he declined the honour on the ground of incompetency.

Before his decease he had occupied himself with the second part of his History. The completion of the work was confided to Lalande, who, with the assistance of several scientific individuals, among whom was Lacroix, published the remaining two volumes in 1802.

As a whole it contains treatises upon the history of almost every branch of the pure and applied sciences, and abounds with interesting details concerning the various discoveries and improvements which have contributed to their progress. The work is now becoming scarce, and we are afraid there is little chance of a republication. It is the only extensive history of mathematics.

MONZA. [MILANO.]

MOOD, or MODE. [VERB.]

MOOLTAN. [HINDUSTAN, vii., 213, 214. The city of Mooltan was taken by the British, Jan. 22, 1849.]

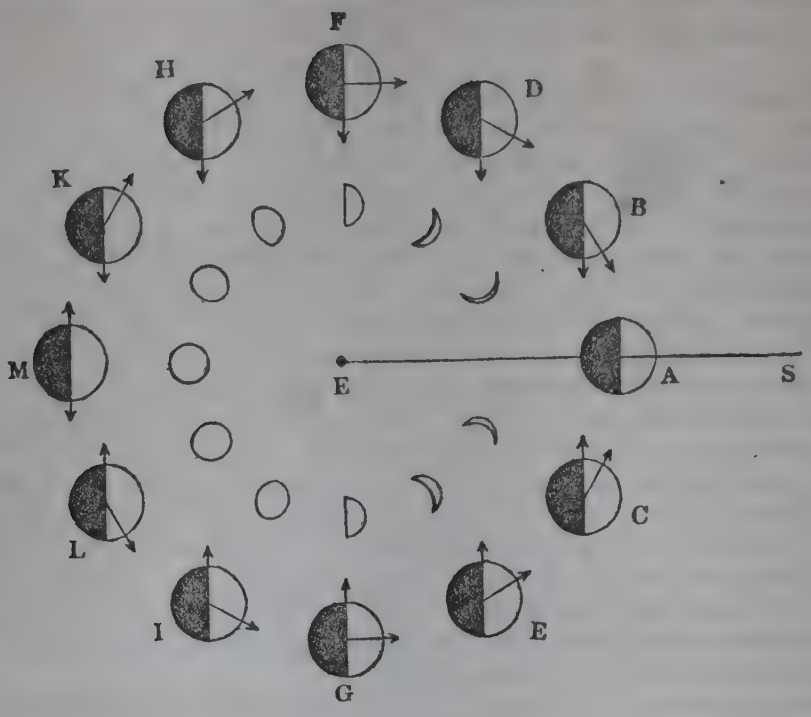
MOON (Latin *Luna*, Greek Σελήνη, Sĕlēnē), the satellite of the earth, a heavenly body which moves round the earth, sharing the motion of the earth round the sun.

In a day or two (depending on the state of the weather) from the time called in the almanacs 'the new moon' a thin silver crescent is seen with its horns turned from the sun and placed to the eastward of the sun, after which it soon sets. Its distance from the sun increases, the horns at the same time growing fuller, until, in $7\frac{1}{4}$ days, it is at ninety degrees (or as far as from the horizon to the zenith) distant from the sun, and the crescent has become a semicircle of white light. The distance still increases, until the moon is 180° distant from the sun, or in the opposite part of the heavens, by which time the light part has become a full circle: this happens in somewhat more than $14\frac{1}{2}$ days from the new moon. The satellite still continues its revolution among the stars, becoming westward of the sun after the full moon, and, decreasing by the same steps as it increased, is lost a day or two before the time which the almanacs point out as the next new moon. The whole of this process takes up what is called a *lunation*, or a *lunar month*; the lunar months are slightly unequal, but their average period is 29 days, 12 hours, 44 minutes, $2\frac{9}{10}$ seconds, or 29.5305887215 mean solar days.

Taking the lunar phenomena in the order of discovery, we next notice that this planet writes its mark on the earth in terms which have been understood from the earliest ages of astronomical inquiry. The alternate rise and fall of the waters, called the *tides*, is found to follow its motions, so that high water is always found to succeed the time when the moon comes on the meridian, whether on the visible or invisible side of it. At first sight it would appear that there is high water twice a day (that is, in the common solar day), but it is found on further examination that the interval between high water and high water is a little more than twelve hours. Now the motion of the moon round the heavens is found to take place (one time with another) in 27.32166142 solar days, which gives 13° 10′ 35″ increase of right ascension in each solar day, or 13° 8′ 23″ in a sidereal day, or actual revolution of the earth. Hence the meridian of the spectator, between two times at which the moon is on the visible side of that meridian, must make so much more revolution as is necessary to overtake a body which revolves through 13° 8′ 23″ while it revolves through 360°; which gives $24^h\ 55^m$ of a revolution of the earth for each lunar day, or $12^h\ 27\frac{1}{2}^m$ for its half. Now the year contains $366\frac{1}{4}$ *sidereal* days, or simple revolutions of the earth; and it will be found that $12^h\ 27\frac{1}{2}^m$ is contained 705 times and a fraction in $366\frac{1}{4}^d$.

We return to the phenomena of the *phases* (Greek for appearances), as they are called, of the moon, namely, the changes in the quantity of its illuminated part. These may be immediately explained on the supposition that the moon is not luminous itself, but receives its light from the sun. To show how this may be, suppose a ball, illuminated by another ball at a great distance in the direction E S, to be carried round the spectator at E. This ball may be always subdivided into a visible and invisible half, since one-half must hide the other in all positions. But it may also be divided into an illuminated and unilluminated half. At A the visible half is all unilluminated, and though we have called it the visible half (meaning in a position to be seen, if there were light), it will not be seen. But when the ball arrives at B, a small portion of the illuminated half is in the visible half, as much as is intercepted between the arrows. At D a larger portion of the illuminated part is visible, and at E a full half of the visible surface is illuminated. A little consideration of this scheme (which is moreover explained in all popular works) will show not only the occurrence of phases precisely similar to those of the moon, but also that the circular boundary of the enlightened part is towards the illuminating body.

If the moon moved in the plane of the ecliptic, or of the sun's motion, as in the figure, there would be an eclipse of the sun at every new moon (A), and of the moon at every full moon (M); since in the former case the moon would hide the sun, and in the latter the earth would intercept the sun's light. The moon however is generally a little on one side or the other of the ecliptic, not enough to introduce any sensible error into the preceding explanation of the phases, but enough to hinder the eclipses from taking



place, except now and then. Again, if the sun remained in the line ES, the lunation, or complete cycle of phases, would be of the same duration as the actual revolution of the moon round the heavens. Since however the sun moves slowly forward in the same direction as the moon, the latter does not alter its phases so rapidly as in the figure, nor is the cycle of phases complete until the moon has overtaken the sun.

It is usual to divide the whole lunation into four quarters, the first from new moon to increasing half moon, the second from half moon to full moon, the third from full moon to waning half moon, the fourth from half moon to new moon. Each of these is called the change of the moon, and it is a very common belief that a change of weather and wind is to be expected, if not at every change of the moon, at least much oftener at the changes than in the intervals. This opinion, when not absolutely received as true, is usually treated as the extreme of absurdity. It is in truth neither one thing nor the other, as the following considerations will show.

The atmosphere is continually undergoing a slight alteration from the effects of the tide. At new and full moon (or rather a little after these phenomena) there are those great tides called the spring-tides, arising from the action of both sun and moon: at the two quarters these luminaries oppose each other, and the quarters are followed by the smaller floods, called neap-tides. What effect may be produced by this succession of smaller and greater oscillations of the sea, which must produce oscillations of the atmosphere, it is impossible to say beforehand. Again, we know nothing of the electric action of either luminary upon the earth, or whether any and what electric state may depend upon their relative position. We have therefore abundant grounds *à priori* to abstain from forming any opinion upon the effect of the heavenly bodies upon the weather; and we shall now state the results of such facts as observation has furnished. A few years ago M. Arago collected the evidence on this subject in an article published in the 'Annuaire:' the general conclusion derived from them is, that upon the whole there is *a little* more rain during the second quarter than during either of the others; but that there is no reason to confirm the common notion that a change of the moon is accompanied by a change of weather. It has also been observed that the height of the barometer is, one time with another, less in the middle of the second quarter than in that of either of the others; and that it is somewhat greater at new and full moon than at the quarters. With regard to a great many other asserted effects of the moon upon animal and vegetable life, it can only be said that there is no conclusive evidence for or against them; nothing but a long series of observations can settle such points, and this is not likely to be made (or if made, to be made fairly) by those who have predetermined the questions in one way or the other.

We now come to the actual motion of the moon round the earth. Roughly speaking, it may be said that the moon's motion is circular, which is sufficient for the explanation of the phases; it is somewhat, but very little, more correct to say it is elliptical. If the moon's orbit were actually exhibited in space, an ellipse might be found which would nearly fit one of its convolutions; but the succeeding convolutions would depart farther and farther from such an ellipse, and it would be nineteen years before a convolution would again occupy which is situated in space near to the ellipse with which we started. And though astronomers have found a way of simplifying the question, by supposing the moon to move in an ellipse which itself moves in space, yet we may better explain the subject by arriving at that ellipse from the real motion than by beginning with it.

When the motion of the moon is watched in the heavens with instruments fitted to measure her apparent diameter, it is soon found that she changes her distance from the earth, becoming alternately larger and smaller. Her path is not very much inclined to the ecliptic, so that she is

never $5\frac{1}{4}°$ from some one of the positions which the sun has had or will have in the course of the year.

The apparent diameter of the moon is observed to vary, owing to an alteration of her distance from the earth. When least it is 29′ 2″.91; when greatest 33′ 31″.07. But it is observed that the least and greatest diameters of a single revolution are not exactly the same as those of another revolution; and also that the place where the diameter is least is not exactly opposite to that in which it is greatest, but always in advance. Now the apparent diameter must be least when the distance is greatest, and *vice versâ;* the point of a convolution most distant from the earth is called the Apogee, that nearest to the earth the Perigee. There is then a progression of the apogee, and its average quantity is no less than 6′ 41″ for each solar day, or 40° 39′ 45″.36 in 365 days; which is equivalent to a complete revolution in 3232.575343 mean solar days, or about nine years. The quantities above given are averages, for the actual progression is irregular.

We may notice then five distinct species of months—1. The average sidereal month, or complete circuit of the heavens. 2. The average lunation, common month, or interval between two conjunctions with the sun. 3. The average anomalistic month, or revolution from perigee to perigee. 4. The average tropical month, or from the vernal equinox to the vernal equinox again (the equinox being in retrograde motion). 5. The average nodical month, or from a node to a node of the same kind. The quantities of these months are as follows (Baily, 'Astron. Tables and Formulæ') in mean solar days:—

	d.	h.	m.	s.		d.
Sidereal month .	27	7	43	11.5	or	27.32166142
Lunation	29	12	44	2.9	,,	29.53058872
Anomalistic month	27	13	18	37.4	,,	27.55459950
Tropical month .	27	7	43	4.7	,,	27.32158242
Nodical month .	27	5	5	36.0	,,	27.21222222

If we compare the lunation with the common year, we shall find that 235 lunations make 6939.69 days, while 19 years make 6939 or 6940 days, according as there are four or five leap-years in the number. Neither is wrong by a day; consequently in 19 years the new and full moons are restored to the same days of the year. This does not absolutely follow, either from the preceding or from the method which gave it, since neither is the coincidence exact, nor are the months exactly equal. But it will generally so happen; and this is the foundation of the Metonic Cycle. [Meton.] Again, 223 lunations make 6585.322 days, and 242 nodical revolutions make 6585.357 days, so that there is only .035 of a day, or 50 minutes difference between the two. This period of 223 lunations is the *Saros*, a celebrated Chaldean period, and contains in round numbers of days 18 years and 10 days, or 18 years and 11 days, according as there are five or four leap-years.

An eclipse of the moon has now lost most of its astronomical importance, and can only be useful as an occasional method of finding longitude, when no better is at hand. Eclipses of the sun, observed in a particular way, may be made useful in the correction of the theory both of the sun and moon; in this case matter is absolutely hid from view by matter, and the moment of disappearance can be distinctly perceived. But in the case of the moon, which is eclipsed by entering the shadow of the earth, the deprivation of light is gradual; so that it is hardly possible to note, with astronomical exactness, the instant at which the disappearance of the planet's edge takes place.

An eclipse of the moon is a universal phenomenon, since the moon actually loses her light, in whole or in part; while in an eclipse of the sun, the moon hides the sun from one part of the earth, but not from another. The former can only take place when the conjunction (or sameness of longitude) of the moon and earth's shadow, that is, the opposition of the sun and moon, or the full moon, happens when the moon is near her node. The subject of eclipses is fully explained, with as little as possible of mathematics, in the 'Library of Useful Knowledge,' 'Astronomy,' pp. 87–101.

MOON SEED is the seed of various kinds of *Menispermum*, and is so called on account of its figure.

MOOR, a name given to extensive wastes which are covered with heath, and the soil of which consists of poor light earth, mixed generally with a considerable portion of peat. The want of fertility in moors arises chiefly from a deficiency or superabundance of moisture, the subsoil being either too porous to retain it, or too impervious to allow it to escape. Both extremes occur in some moors, which are parched up in dry weather, and converted into a dark mud by any continuance of rain. A considerable portion of iron in a state of hydrate is also generally found in the soil of moors, which is very hurtful to the vegetation of plants, except heath, furze, and other coarse plants, which almost entirely cover the moors. This iron is carried down through the light surface-soil, and, if it meets with a less porous earth below, is frequently deposited in a thin layer, cementing the particles of silicious sand, which are carried down with it, and forming what is called the *heath-pan* or *moor-band*. This substance is perfectly impervious to water, and wherever it exists in a continuous state, all attempts at improvement are vain, till it is broken through or removed. The roots of trees occasionally find a passage through interstices or fractures of the pan, and then often grow luxuriantly. But wherever young trees are planted, without the precaution of breaking through the moor-band, they invariably fail, and disappoint the expectations of the planter, who, seeing fine large trees growing around, naturally imagined that the soil was peculiarly fitted for them. When the moor consists of a loose peaty earth of little depth incumbent on a rock, as is the case in many mountainous countries, no art can fertilise it.

In the valleys, where the waters have brought various earths mixed with decayed vegetable matter from the surrounding hills, the substance deposited is mostly peat. When the peaty matter is mixed with a considerable portion of clay and sand, forming a peaty loam, and a convenient outlet can be found for the superabundant water, it is

very capable of improvement, chiefly by draining, burning, and liming. As soon as the heath is destroyed by burning it together with a portion of the surface, and the peat-bog has acquired a certain consistency by draining, the application of hot lime will enable it to produce potatoes and oats, and the peaty matter will soon be converted into a rich soil, abounding in humus, and requiring only repeated cultivation to become extremely fertile. Sometimes extensive moors have been converted into flourishing farms of arable and grass land, as in many parts of Scotland and the north of England; sometimes they have been most advantageously planted with forest-trees, and, where there is a great extent of waste and a scanty population, this is generally the most certain mode of improving a property, although the return is slow and distant.

MOOR-BUZZARD, the English name for *Circus æruginosus* of Aldrovandus and authors.

MOOR-COCK, one of the names of the Red Grouse.

MOOR-FOWL, one of the names of the Red Grouse.

MOOR-HEN, the common English name for the *Gallinule*, or Water-Hen, *Fulica chloropus*, Linn.

MOOR-TITLING, one of the names for the Chick-Stone, Stone-Cutter, Stone-Chat, and Stone-Smith, *Saxicola rubicola*, Bechst.

MOORE, EDWARD, was born in 1712, and bred to the business of a linen-draper, which he quitted for the pursuit of literature. His first metrical work was 'Fables for the Female Sex.' His dramatic pieces were, two unsuccessful comedies, 'The Foundling' and 'Gil Blas;' and 'The Gamester,' a tragedy, which, without any striking touches of genius, still retains its place on the stage. The last literary undertaking in which Moore became engaged was the editorship of 'The World,' a miscellaneous weekly paper, which terminated with the death of Moore, in 1757.

MOORE, Dr. JOHN, M.D., was the son of a minister of the Scotch church, and was born at Stirling, in 1729. After having studied in the university of Glasgow, he served for a time as a medical officer in the British army in Flanders, in 1747–8, and subsequently became surgeon to the household of the Earl of Albemarle, English ambassador to France. After taking his degree at Glasgow, as a physician, he was induced, in 1772, to accompany the young Duke of Hamilton to the Continent, in the joint capacity of medical attendant and travelling tutor. Returning home in 1778, he gave the result of his observations of foreign countries to the world in two lively works, under the title of 'A View of Society and Manners in France, Switzerland, and Germany,' and 'in Italy.' These were followed by a volume of 'Medical Sketches,' and by 'Zeluco,' the ablest and most popular, as well as the first, of his novels. He wrote various other works. He died at Richmond, near London, in 1802.

MOORE, SIR JOHN, was the eldest son of the author of 'Zeluco.' He was born at Glasgow in 1761, and received his first commission in the army at the age of fifteen years. It was in the descent of the British troops upon Corsica, in 1794, in concert with Paoli, that Moore first distinguished himself; and in the West Indies in 1796, in Ireland during the rebellion of 1798, and in the expedition to Holland in the following year, he established for himself the reputation of an officer of the highest promise. In the expedition to Egypt, in 1801, he commanded the reserve of the army, and highly distinguished himself at its head. For his services in this campaign, he was created a knight of the bath.

On the recommencement of hostilities, after the short peace of 1802, Moore was employed in a camp of instruction on the Kentish coast. After being for some time employed in the occupation of Sicily, and in an expedition to Sweden to assist Gustavus Adolphus IV., he was selected to command the army in the Spanish Peninsula. He landed in Portugal, in August, 1808, too late to share in the battle of Vimiera: but his force being intended to co-operate with the Spanish forces in the north of the Peninsula against the French invaders, he began his march from Lisbon in October, 1808. He had scarcely entered Spain before the defeat and destruction of the Spanish armies at all points on their northern line, utterly extinguished the prospect of a successful campaign; false intelligence deceived him; and he suddenly ascertained that the whole of the disposable French armies in the Peninsula were gathering to surround him. Rejecting all hope of the defence of Portugal, he commenced a rapid retreat to Coruña: the sufferings and disorders of which, conducted as it was in the depth of a severe winter, and through the mountainous region of Gallicia, will long be remembered in our military annals. Its disasters were closed, on Jan. 16, 1809, by the battle of Coruña, in which the troops, though previously to all appearance exhausted and disorganised, were reanimated by the exertion of their gallant leader and their own native valour, to inflict a decisive repulse upon their pursuers. Their triumph was dearly purchased by the death of their commander.

MOORISH ARCHITECTURE, otherwise the Moresque style, that variety of Saracenic or Mohammedan architecture practised by the Arabs or Moors of Spain, and of which many exquisite remains in that country, at Cordova, Granada, &c., still attest both their skill and taste. One of its most striking and peculiar features is the *horse-shoe arch*, or, as it might with more propriety be termed, the *crescent arch*, because it resembles that symbol of Mohammedan faith.

Fig. 1 is an example of the crescent or horse-shoe form, the centre *c* being raised above the chord of the arch, and the curve being consequently greater than a semicircle. The side or half A shows the arch supported on columns, the side B without columns; besides which it illustrates other variations.

The cusped or scalloped arch is also very general; the outline is produced by intersecting semicircles, similar to the trefoil-headed compartments in gothic windows; but, beyond that general resemblance, the character is altogether different.

Fig. 1.

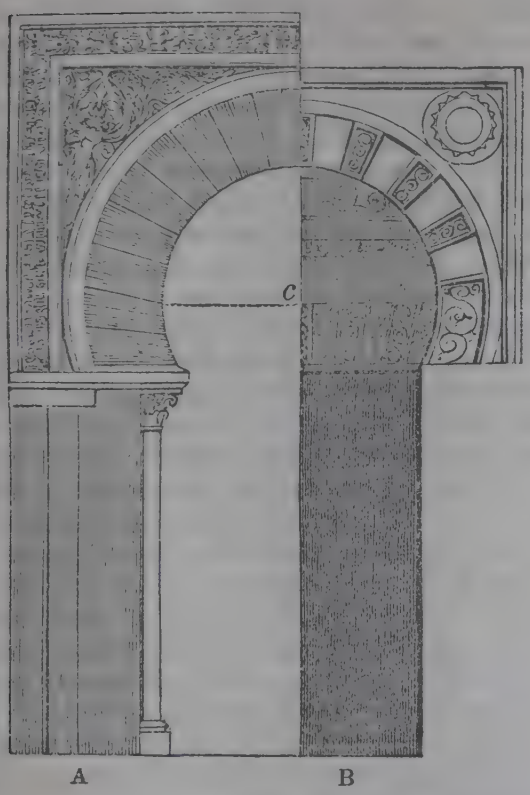


Fig. 2 exhibits an example of the slender pillars peculiar to Arabian architecture; and also another variety of Moorish arches from the Court of the Lions in the Alhambra. Some have

Fig. 2.

imagined that this element of slenderness in regard to pillars indicates a tent origin of the style, a character which was further kept up by concave ceilings and cupolas, emblazoned with painting and gilding. The whole surface was frequently broidered over with decoration, which consisted almost entirely of ornamental patterns composed either of foliage or geometrical figures, though occasionally with an intermixture of both. The decorations of the former class have given rise to the modern term *Arabesques.*

One very prevalent and very peculiar element of Arabian decoration is the use of inscriptions evidently with reference to their ornamental effect. So far there is a very striking analogy between the practice of the Moslems and that of the ancient Egyptians.

Lattice or open trellis-work was another fertile source of embellishment, and was very much akin to the perforated tracery frequently met with in gothic buildings.

Of perforated battlements and parapets this style furnishes some exceedingly rich and tasteful specimens, although not among the remains of Moorish architecture in Spain.

Great fancy and diversity of invention are shown in the devices of mosaics and pavements, many of which appear exceedingly elaborate, although, when analysed, they are found to be very simple in principle. Among the other ornaments which mark this style, the honeycomb fretwork and stalactite-like drops, or pendents, of ceilings and roofs, deserve to be mentioned; also the small star-shaped apertures cut in a sloping direction through the domes or vaults over baths, for the purpose of admitting only a subdued degree of light. Domes and minarets are features almost confined to mosques and other religious edifices.

MOORS. This name is generally given to the Arabs who subdued Spain at the beginning of the 8th century, and held it until the latter end of the 15th. It is their most common denomination, and perhaps the most appropriate, owing to their having come from that part of Africa known to the Romans by the name of Mauritania.

Thirty-five years after the death of their prophet, the Arabs, after conquering the fertile regions of Asia, invaded the vast continent of Africa, and having firmly established themselves there, they invaded and subdued Spain.

In 711 Tárik, a freedman of Músa Ibn Nosseyr, the Arabian viceroy of Africa, landed with a small band of followers at the foot of the rock Calpé, which received afterwards his name (Jebal-Tárik, or Gibraltar), and two months after his disembarkation, the memorable battle was fought on the banks of the Guadelete, which put an end to the Gothic empire of Spain. Cordova, Granada, Jaen, Malaga, Toledo, then the capital of Spain, were either speedily reduced, or opened their gates to the conquerors. On the arrival of Músa the whole country, with the exception of the mountain crags of the Asturias, was subdued.

First Period, 711–756.—*Governors of Mohammedan Spain.*—Abd-el-Azíz, son of Músa, followed up the conquests made by his father. He subdued Lusitania, invaded Navarre, and consolidated the Arabian empire of Spain.

Abd-el-Rahman was among the most famous of Músa's successors. His administration was signalised by acts of justice; he punished those local governors who had been guilty of oppression, and restored to the Christians the lands which had been taken from them. In 732 he invaded Gaul at the head of the largest Mohammedan army which had yet trodden the plains of the Continent, and penetrated as far as Tours, where he was defeated by Charles Martel.

Yúsef al-Fehri was the last governor who ruled over Spain in the name of the Eastern khalifs.

Second Period, 756-1036.—*Spain under the Sovereigns of the House of Umeyyah.*—On the overthrow of the dynasty of the Beni Umeyyah in the East, a descendant of that family, Abd-el-Rahman Ibn Muawiyah escaped from the general massacre of that family in 748, and landed on the coast of Spain in the early part of 755. He was received with open arms by the inhabitants; and, after defeating in two pitched battles (756) the generals of the khalif, he made his triumphant entry into Cordova the same year. Spain now ceased to be a dependency of the Eastern Empire, and continued to be governed by the posterity of Abd-el-Rahman, who received the surname of Ad-Dákhel or the Conqueror. His reign was long and prosperous.

Al-Hakem I., grandson of the Conqueror, on the pretext of a slight disturbance in one of the suburbs of his capital, gave orders in 818 that it should be razed to the ground, and that the inhabitants, about 40,000 in number, should be transported to Africa, whence a considerable body passed to Egypt and seized on the island of Crete, which they kept until 961.

Abd-el-Rahman III., who succeded to the throne in 912, may safely be pronounced the greatest monarch that the Spanish Arabs ever had. His expeditions against the Christians were extremely successful. His dominions too were considerably increased by the addition of a large portion of Mauritania, and the city of Fez, its capital, which he wrested from the hands of the Idrisites. Elated by so much success, Abd-el-Rahman shook off the yoke which, in religious matters at least, still bound Spain to the East, and assumed the titles of Amir-el-Múmenin (commander of the faithful), Khalif, and Imàm. His additions to the great mosque of Cordova, the foundation of the town and palace of Az-zahrá, the endowment of several colleges and schools, the formation of an extensive library within his palace, the construction of roads, canals, and aqueducts, all attest his taste for luxury, his love of the arts, and his unceasing activity. After a prosperous reign of upwards of 50 years, Abd-el-Rahman died in 961.

Hisham, a weak prince, who succeeded to the throne in 976, took no part in public affairs. The government was conducted in his name at first, by Al-Mansúr, a very successful warrior, who is said to have directed no less than seven and twenty expeditions into the very heart of the Christian dominions, which he seems to have entertained the idea of reducing entirely to the sway of Islám. After his death in 1008, the country became a prey to civil war and anarchy, caused by the ambition of various persons competing for the sovereignty in the place of Hisham, who was kept in confinement, and who is said to have been secretly put to death. But the power of the Umeyyah dynasty, and indeed of the Mohammedan empire of Spain, was fast decaying. The governors of the provinces refused all allegiance to the sultans of Cordova. The ancient inheritance of the khalifs was cut up into a thousand petty kingdoms, which being isolated and weakened, fell an easy prey to the attacks of the Christians.

With Hisham III. (1031) ended the Khalifate of the West.

Third Period, 1031-1238.—*Independent Kingdoms.*—With the extinction of the khalifate of Cordova, the ambitious local governors throughout the Peninsula threw off the mask, and, asserting their independence, assumed the title of kings. After a bloody civil war, most of the smaller states were again blended into one or another of the great kingdoms, and (at the end of the 11th century) Mohammedan Spain was divided among Mohammed Ibn Abbád, king of Seville, Yahya, king of Toledo, Al-Mostaïn, king of Saragossa, and Omar Al-Motawakel, king of Badajoz and part of Portugal.

During this period of troubles and civil war a considerable portion of Portugal and much of New Castile fell into the hands of the Christians, who were pursuing their conquests, when a religious and political revolution changed the aspect of affairs in the Peninsula.

Empire of the Almoravides, 1099-1146.—Towards the middle of the 11th century two men, named Yahya Ibn Ibráhím, and Abdallah Ibn Yásim, succeeded in rescuing some of the African tribes who dwelt beyond the chain of Mount Atlas from the state of gross ignorance in which they lived, and in instructing them in the dogmas of religion. Under the pretext that to diffuse a holy religion was among the most imperative of duties, Abdallah easily prevailed upon his obedient disciples to make war upon their neighbours. This confederacy received the name of Murabitins, or Almoravides, which signifies men consecrated to the service of God. Abdallah now assumed the title of Amír, and was succeeded by Abú Bekr, whose cousin, Yúsef Ibn Táshfín subdued Fez and the greatest part of Mauritania, and in 1073 the power of the Almoravides was acknowledged throughout northern and part of central Africa. To Yúsef the Mohammedan princes of Spain had recourse when pressed by the victorious arms of the Christians. Yúsef crossed the strait at the head of a powerful army (Aug. 1086), and meeting Alfonso VI. king of Castile and Leon, near Badajoz, at a place called Zalaca, gained over him a signal victory (Oct. 1086), which, being followed by other successes, had the effect of checking the progress of the Christian king. Yúsef, struck by the fertility and pleasing aspect of the Peninsula, turned his arms against the people whom he was called to protect, and succeeded in establishing his supremacy in Spain.

Yúsef died in Marocco, in 1106. He was succeeded by his son Ali, who, in 1108, defeated near Ucles an army of Castilians, and slew the infante Don Sancho, son of Alfonso VIII. In 1118 however the important city of Saragossa was wrested from the Moslems, and the north of Spain was for ever freed from their sway.

To Ali, who died in February, 1143, succeeded Táshfín Abn Ali. Obliged to defend his own kingdom of Mauritania against the attacks of the Almohades, Spain was left to its own resources. Táshfín died in July, 1145, at Oran.

Ibráhím Abú Ishák succeeded his father. Unable to resist the rising power of the Almohades, who were wresting from him city after city, he shut himself up in the city of Marocco. On the surrender of that place, in 1146, he was immediately beheaded.

Empire of the Almohades.—Mohammed Ibn Abdallah, a native of Herga in Africa, or, according to some authors, the son of a lamp-lighter in the mosque of Cordova, was the founder of a new religious sect, which originated in the deserts bordering on Mount Atlas, and soon spread over the whole of Africa. In 1121, after associating Abd-el-Múmen with himself in the empire, he marched against the Almoravides at the head of considerable forces. In 1122 he defeated their army. Marocco, Fez, and other important cities were subdued in 1125 by Abd-el-Múmen, and in 1149 the whole of northern Africa acknowledged the yoke of the Almohades.

Mohammed died in 1129. He was succeeded by Abd-el-Múmen, who was eager to add the possession of Spain to his African conquest. This was accomplished, and he died in 1163.

He was succeeded by his youngest son, Yúsef Abú Yakúb, who, in 1171, built in Seville the famous mosque and the magnificent square tower belonging to it, which forms at present part of the cathedral. He invaded Castile, and after laying the country waste and taking several fortresses, returned victorious to Africa. He died in 1184.

Abu Yúsef Yakúb, better known by the surname of Al-Mansúr, landed at Algesiras, and defeated Alfonso IX. of Castile in the plains of Alarcos. He then marched against Toledo, and, although he could not reduce it, he took Madrid, Guadalaxara, and all the surrounding territory. Yúsef died in 1199.

Mohammed Ibn-Abdallah succeeded. In 1211 he crossed the strait with an army, the largest perhaps that Africa ever poured on the shores of Spain, but he was defeated, and the battle of Las Navas may be considered as one which involved the ruin of the Mohammedan empire in Spain. Mohammed died in Marocco, in 1213.

The reign of Yúsef II., surnamed Abú Yakúb, was a scene of continued troubles. He died without issue, in January, 1224. His successor, Abl-Málik Abd-el-Walid, lost both life and empire a few months afterwards (1224) at the hands of Abdallah Abu Mohammed, surnamed Al-Adel, who himself was strangled in October, 1227.

Al-Mámún Abú Ali had to contend in Africa against his relative Yahya, who disputed the throne with him, and in Spain against an enterprising chieftain, Ibn Húd, who had himself proclaimed king of Mohammedan Spain, and ultimately succeeded in wresting that country from the Almohades. Al-Mámún died in 1232.

Mohammed, the successor of Al-Mámún, strove in vain to re-establish his supremacy in Spain. Cordova surrendered to the Christians in June, 1236; Valencia capitulated in September, 1238; Denia in May, 1244; and during the year 1246 all the fortresses on both banks of the Guadalquivir, from Jaen to the gates of Seville, fell into their hands.

Mohammed Ibn-Al-Ahmar, king of Granada, became the vassal of Ferdinand III., who in 1248, assisted by his powerful subject, wrested from the Moslems the important city of Seville.

Fourth Period, 1238–1492. *Kingdom of Granada.*—By becoming the vassal of Ferdinand III., the new king of Granada, Mohammed Ibn Al-Ahmar, insured peace for his dominions as long as Ferdinand lived. However, on the death of Alonso X., a desultory warfare was prosecuted on both sides, which ended in a truce in 1266. Ibn Al-Ahmar died in January, 1273.

He was succeeded by his son, Mohammed II., under whose reign another attempt was made, but in vain, by the Africans to re-establish in Spain the supremacy of Islám.

Mohammed III., surnamed Abú Abdalla, had not only to contend against his own subjects, but to defend his kingdom from the Christians. In 1309 he was obliged to resign his throne to his brother Nasser.

The commencement of Nasser's reign was propitious. Ceuta, which had become one of the keys of the straits since the Christians held Gibraltar, was reduced by his generals. In 1314 the people of Granada rose and proclaimed Ismail Ibn Faraj.

Ismail Ibn Faraj, surnamed Abú-el-Walíd, was a prince of the blood. Although, in 1316, he failed in his attempt to take Gibraltar, he gained (1319) a most signal victory over the Christians. Martos and Baza were taken in 1325, and the limits of his empire were considerably extended through his conquests in Murcia. He was assassinated by a relative, whom he had offended, in 1325.

His son Mohammed IV. was raised to the throne of Granada. Othmán, the captain of his guards, revolted, and proclaimed Mohammed Ibn Faraj. Othmán, who belonged to the royal family of Fez, having obtained reinforcements from Africa, took Algesiras, Marbella, and Ronda. In 1329 Mohammed retook Baena, recovered Gibraltar in 1330, and reduced the rebel governors to obedience. However, as he was preparing to cross over to Africa, he was assassinated at Gibraltar, in 1333.

Yúsef Abu-l-Hejaj, his brother, was raised to the throne. During his reign the Africans under their king Abu-l-Hasan made a last but unsuccessful attempt to plant the banners of Islamism in the centre of Spain. In 1352 Yúsef was stabbed while at prayers in the mosque by a madman.

Mahommed V., the eldest son of Yúsef, in-

herited the virtues and the abilities of his father. Some discontented chieftains, in 1359, attacked his palace, and massacred the guard, but Mohammed escaped. Finding their victim gone, they proclaimed his brother Ismail their leader.

Ismail II. very shortly himself fell a victim to the ambition of one of his courtiers, Abú Said, who made him a prisoner in a sally, and had him put to death in 1360.

The usurper Abú Said being at war with Pedro, king of Castile, and with the dethroned monarch Mohammed V., whose authority was still acknowledged in Ronda and the neighbouring districts, offered to hold his kingdom as an hereditary fief of the Castilian crown, but he was murdered in the palace of Pedro, at Seville, in 1362. By the death of the usurper, the throne of Granada devolved upon the legitimate sovereign, Mohammed, who died in 1391.

Yúsef II., surnamed Abú Abdallah, succeeded to his father. Yúsef invaded Murcia (1391), but without much success. He died in 1395, with symptoms of poison.

No sooner had Yúsef expired, than Mohammed VI. seized on the sceptre, to the prejudice of his eldest brother Yúsef. The Moors took Ayamonte in 1397. This success however was more than balanced by the loss of Zahara and other towns, which the regent Ferdinand took from them in 1407. Mohammed died in 1410.

Immediately after Mohammed's death, his brother, Yúsef III., was placed on the throne. He governed the kingdom with comparative tranquillity. Yúsef died in 1424.

Mohammed VII., surnamed Al-Yaiserí, succeeded his father Yúsef. He fled in terror from an insurrection in 1428, and the vacant throne was filled by Mohammed VIII. At the head of an army furnished him by the king of Tunis the dethroned monarch appeared the ensuing year, besieged the usurper in his palace, and beheaded him in 1430. But Mohammed was destined to lose his throne a second time, for Yúsef Ibn Al-Ahmar made an alliance with John II., king of Castile, and in 1435 he marched on Granada, and entered the capital, while Mohammed fled to Malaga.

Yúsef IV. was hailed king, but, after a reign of six months, he died in 1435, and Mohammed, the dethroned monarch, was again proclaimed. Not even then was the unfortunate king suffered to govern in peace, for in 1445 his nephew, Mohammed Ibn Othmin, seized on the Alhambra, took Mohammed prisoner, and confined him to a dungeon, where he passed the remainder of his days.

The usurper was proclaimed under the name of Mohammed IX., but was opposed by Mohammed Ibn Ismail, and for four or five years Granada was exposed to all the horrors of a civil war. At last, in 1454, the rebels marched against Granada, defeated the royal troops, and entered that capital, from which the Moorish king escaped in disguise.

Mohammed X., son of Ismail, reigned for twenty-one years in comparative tranquillity. In 1460 the Christians took Gibraltar and Archidona, and subdued all the intermediate country. A peace was concluded in 1463, on condition that the Moorish king should hold his kingdom as a fief of Castile. Mohammed died in 1466.

Muley Ali Abu-l-Hasan, the eldest son of Mohammed, succeeded him. In 1470 the governor of Malaga revolted, and did homage to the king of Castile. At that time the two powerful states of Aragon and Castile were united, and the doom of the kingdom of Granada was sealed. The court was divided into two hostile factions—that of Ayesha and Zoraya, the two wives of Abu-l-Hasan. The tribe of the Thegrís (Zegris) supported the former; that of the Beni Serraj (Abencerrages) the latter. One held the Albayzin, the other the Alhambra; and the streets of Granada were stained with the blood of its inhabitants. Although Abú Abdallah succeeded in dethroning his father in 1483, he was himself taken prisoner in 1483. Abú-l-Hasan regained momentary possession of his capital in 1484, but he was soon disturbed by Abú Abdallah. At last the people of Granada appointed Abdallah, surnamed Zagal, their king. In June, 1484, he took Alora and Setenil. In 1485, Ronda, Marbella, Coïn, &c., fell into his hands: Loxa surrendered in 1486, and the ensuing campaign began by the taking of Malaga. Profiting by the absence of Zagal, Abú Abdalla As-Saghir marched upon Granada, and usurped the throne.

This monarch was the last king of Granada. In the spring of 1491 Ferdinand invested that capital, and after a siege of nearly a year, the standard of the cross waved on the red towers of the Alhambra.

Government, Institutions, &c.—The government and institutions of the Spanish Arabs may be said, with very few exceptions, to have been modelled upon the eastern khalifate. But although the principles of government were the same as in the east, and the vices of Mohammedan constitutions as prominent, yet the position of the Spanish Arabs contributed to give to their institutions a vigour and solidity which they never possessed in the East. Agriculture and trade were fostered by means of wise and paternal regulations; population increased at an astonishing rate; and the revenue was computed at five millions sterling. Europe became indebted to her Mohammedan invaders for the first lessons of science and learning. The first Moorish conquerors of Spain were a rude and illiterate people. It was not till the time of Abel-el-Rahman, the first of the Beni Umeyyah (A.H. 139, A.D. 756), that any attention was paid to the cultivation of letters. That monarch and his successors founded colleges, formed public libraries, encouraged literary pursuits by their example and their liberality, and by their successive efforts the study of the sciences was introduced into their states, and continued to flourish to a later period in Spain than in the East. Poetry has always been the favourite pursuit of Eastern nations: by the Arabs it was cultivated with an ardour which amounted to a passion, and the taste was rather increased than abated in Spain. The historians of Mohammedan Spain are numerous, but their

merits are generally not great. The most ancient is Abú Beker Al-Rázi, who flourished towards the end of the 9th century. It was in the physical and experimental sciences that the Spanish Moslems most excelled. From the establishment of the Umeyyah dynasty, the greatest attention was paid to the study of mathematics and all the other exact sciences. Copies of the works of Dioscorides, Hippocrates, Galen, Aristotle, Apollonius, and other Greek writers, were procured in Constantinople, brought to Cordova, and translated. A Spanish Arab, a native of Toledo, named Az-Zarkal, improved the astrolabe, and invented an instrument for observing the motions of the heavenly bodies, which was long known in Europe by the name of its inventor. The mechanical arts and manufactures were likewise carried to considerable perfection. The use of writing-paper was introduced by them into Europe; gunpowder was also improved, and first used by them in war; and there is every reason to suppose that to them belongs the honour of the discovery of the Mariner's Compass.

MOORSHEDABAD, the capital of the district of Moorshedabad, and long the nominal capital of Bengal, is situated in 24° 11′ N. lat., and 88° 15′ E. long., on a branch of the Ganges, about 120 miles above Calcutta, following the windings of the river. Moorshedabad is an open town, and the buildings extend on both sides of the branch of the Ganges on which it stands. It is an ill-built town, presenting a great assemblage of mud huts, placed without any regard to order, and intermixed with numerous trees. There are a few tolerably good brick houses, and some mosques, but altogether the city may be pronounced one of the meanest in appearance in all India. The most conspicuous building in the town is the residence of the nabob, a modern house in the European style; the old palace is in character with the general aspect of the place.

Cossimbazar, a town about one mile to the south, which may be considered its port, is a place of very large traffic, especially in the rainy season, when there is great facility for water-conveyance. The stream is not navigable during two or three of the dryest months in each year. The population of Moorshedabad is estimated at about 160,000.

MOOSE-DEER. [Deer.]

MORAL SENSE is a name which, occurring first in Lord Shaftesbury's 'Inquiry concerning Virtue,' and afterwards adopted by Hutcheson, has since come to be very generally employed to denote the feelings with which we regard men's actions and dispositions. These feelings are known also by the name of feelings of moral approbation and disapprobation. There is no dispute about the fact that men have moral judgments; but the dispute is as to the origin of them. It is generally supposed that they must be either a part of man's nature, like his other faculties, or that they must be derived from the exercise of his faculties. Those who consider that there is a faculty by which we discern between right and wrong, sometimes call it a Moral Sense, by way of analogy. Others think that the morality or immorality of actions depends on the influence of those actions, and of the dispositions in which they originate, upon the happiness of mankind; and that we form this judgment of the consequences of actions, that is of their morality or immorality, as we do of anything else, by the exercise of our understanding and of our senses: this is the theory of Utility. Those who will judge of things by the constitution of our nature and of the things around us, will not accept either theory to the total exclusion of the other. [Morals.]

MORA'LES, AMBROSIO, a Spanish historian, was born at Cordova, in 1513. While yet a youth, he produced a translation of the 'Pinax' or 'Tablet' of Cebes. At the age of nineteen Morales became a Jeronymite, and evinced much religious enthusiasm. After the death of his father, he became professor at Alcala. On the death of his friend Florian de Ocampo, he obtained the vacant place of royal chronicler. He extended the 'Cronica General de España,' which Ocampo had carried no further than the death of the Scipios. After he had continued the history to the end of the Gothic period, Morales was sent to Leon, Galicia, and Asturias, to examine sepulchres and temples, archives and libraries: he collected much curious matter which was published, from the original MS. in the Escurial, by the antiquarian Florez in 1765, and has been since inserted in the complete collection of his works, Madrid, 1791-2. In his 70th year (1583) he finished the third volume of his history, which completed the work to 1037. Morales died in 1591.

MORA'LES, LUIS, a Spanish painter, surnamed 'El Divino.' His Saviours and Magdalens exhibit the extreme of human suffering endured with a celestial meekness. Philip II. relieved Morales, who was suffering from poverty and old age, with a yearly pension of 300 ducats. He thus made some slight amends for having dismissed him and for having refused to employ his talents at the Escurial. Morales was born at the beginning of the 16th century, at Badajoz, where he died in 1586.

MORALS is a word used in several different senses. 1. It has been employed, together with the expressions *moral philosophy* and *moral science*, to denote the whole field of knowledge relating to the mind of man. To this use of the word there are many objections; and it has accordingly now almost entirely ceased. 2. *Morals*, as well as the expressions *moral philosophy* and *moral science*, denotes specially the science of what is called man's duty, what he ought and ought not to think, feel, say, do. This is the most convenient use of the word, and is now generally sanctioned by custom. In this sense of the word *morals*, it is convertible with *ethics* and with *deontology*, a word which was coined by Mr. Bentham. 3. *Morals* and *ethics* are also names for the art corresponding to the science which has just been spoken of, the art of performing one's duty. The art and the science being coextensive, and differing only in this, that the same subject-matter is viewed from different points, the indiscriminate application of the same term to both engenders no confusion worthy of notice. 4.

Morals is, in current conversation, synonymous with *morality;* thus denoting not only the science and the art, but also what is the subject-matter both of the one and of the other.

Morals then is a name for the science which teaches what it is man's duty to do and not to do, or what he ought and ought not to do; or again, what it is respectively right and wrong for him to do; or which teaches what is virtue and vice.

The word duty implies obedience to some fixed rule, and the word rule implies ruler. There is only one supreme ruler, and that is God. All morality then has reference to a supreme power, or to a belief in powers whose will is a law or rule to man. The rules of morality among those nations to whom Christianity was not known, and to whom it is not known now, are not derived from revelation. There are two revelations which are the authority for moral rules, that given to the Jews, and that given through Jesus Christ. The revelation of Jesus Christ does not contain a complete set of rules adapted to the conduct of life, but it contains all the principles which are necessary to guide man in the conduct of life. The duties which a man owes are to God and to his neighbour. Those which he owes directly to God belong to the province of religion: those which he owes to his neighbour are also duties to God, for they are not due to his neighbour except by virtue of its being God's will that he should conduct himself in such and such a manner towards his neighbour. This second part of a man's duty is thus expressed by some writers—The conduciveness of a thing to the general happiness of mankind is the criterion of duty. To know therefore a man's duty fully, we must, according to this statement, know what is conducive to the general happiness of mankind in order to know our whole duty. Thus a foundation is laid for a wide investigation, which may form a science of Morals.

As there is morality or there are rules of morality among nations, who have had no direct revelation of God's will, for instance the Greeks and Romans before Christianity was accepted by them, we must admit that a system of morality can be framed independent of revelation, and that morality does and must exist independent of revelation. Whether those nations which accept Christianity can be considered as having any system of morals independent of it, would seem an idle question, for the Christian revelation, though it does not give a complete body of rules for moral conduct, can not be considered a sufficient revelation if it does not contain enough to solve every moral question that may arise. But as there are many nations which do not accept Christianity, and some individuals in Christian nations who do not accept it, though all such nations and all such individuals do admit the necessity of some moral rules, it is a proper subject of investigation to ascertain what such rules are, independent of revelation, and what is their criterion.

To make the pursuit of a man's own happiness a rule of life, and the furtherance of human happiness generally a duty, and consequently a rule, is a vague way of talking, though it is the way of talking of some writers who affect a great precision, and treat opinions which differ from their own with very little respect. It is true that neither man's nature impels him to seek unhappiness directly as such, nor is it his duty to cause unhappiness to others, as such; and it may be admitted, that a man's happiness well understood, and the happiness of mankind in general, so far as happiness is attainable, do in the main coincide with the performance of duty; in the main, but not always. Writers on morals differ very little as to the rules of morality. The difference lies in establishing the foundation and criterion of them; and it appears to be an error to found them on one principle only, such as that which is sometimes called the Moral Sense [Moral Sense], or on the criterion of conduciveness to the general happiness; for there seems to be no doubt that we do possess a power by which we approve or condemn many acts directly, without any reflection or consideration of general consequences; and it is also undoubted, that we do in many cases look to the consequences of our actions to ourselves and to others as a measure or criterion by which to judge them. The fact is, that in many cases there is the necessity, in order that there may be a moral government in the world, of a prompt and rapid judgment of thoughts and actions; in other cases the judgment can not be formed without reflection and consideration. There is no inconsistency in saying that man has a short and ready rule for some occasions; and that for others he must deliberate, and even call in the advice and counsel of others, the experience of past ages as well as the opinion of his own.

In order to determine man's conduct towards the rule of right, we must avail ourselves of all the motives that can be applied, and all the considerations that can be urged. That it is his duty to promote the happiness of his fellow creatures is so far true as it contains the recognition of the principle, that man lives not for himself only, but for society; and therefore it is his duty to follow such rules of conduct as are conducive to the well-being of this society. These rules are both positive and negative, rules for action and rules for forbearance. The negative rules are reducible to few, and are generally well understood, though imperfectly practised. A strict observance of them is essential to virtue; but mere negation is not virtue, which consists in action. Though it is here admitted that the happiness of our fellow creatures, so far as happiness is attainable, is consistent with the notion of duty, it is not here admitted that this happiness is the true measure or criterion of duty; nor is it admitted that happiness can be so defined or described as to be a measure or criterion.

MORAT. [Freyburg.]

MORATIN, NICOLAS FERNANDEZ (the elder Moratin), was born in 1737, at Madrid, where he died in 1780. Moratin's three discourses, 'Desengaños al Teatro Español,' drove from the stage, with the aid of an injunction from government, the 'Autos Sacramentales.' Besides remodelling the drama, Moratin was a still more successful restorer of lyric poetry in Spain. In 1764

he published periodically some of his light poetry, under the title of 'El Poeta,' and soon after appeared 'La Diana.' In 1770 he succeeded, in spite of the opposition of the anti-reformist performers, in bringing also on the stage his 'Hormesonda.' He wrote another tragedy, 'Guzman el Bueno,' but it was not performed. Moratin practised the law merely for the sake of providing for his wife and son. From this uncongenial labour he was released by Ayala, who selected him as the person best qualified to fill his chair of Poetica. By a 'Memoir on the means of encouraging Agriculture in Spain without injuring the Breed of Cattle,' Moratin attracted the attention of the Economical Society of Madrid, and soon became an active member of it.

Many of Moratin's prose writings, and the whole of his interesting correspondence with Bayer, Conti, Llaguno, Cadahalso, and others, have been lost in consequence of repeated searches and seizures of the family papers in Ferdinand's reign. There is a collection of dramas and other works of Moratin, but it is a very rare book.

MORATIN, LEANDRO FERNANDEZ, son of the preceding, was born at Madrid, on March 10, 1760. He began to versify at six or seven years of age, and obtained at the age of eighteen a second prize or *accessit* from the Spanish Academy for his heroic poem entitled 'Toma de Granada.' Moratin had been apprenticed to a jeweller, and practised the art for some time, without however discontinuing his intercourse with many learned and scientific men, or his own poetical efforts. He gained another prize for his 'Leccion Poética,' a satire; and in 1789 published in prose his anonymous 'Derrota de los Pedantes,' written in the fashion of the 'Viage al Parnaso' of Cervantes. In the same year, the celebrated minister Floridablanca rewarded his ode to the new king, Charles IV., with a small pension; but he was at last raised to independence by the minister Godoy.

In 1790 he brought out his play of 'El Viejo y la Niña,' his first and most felicitous drama. In 1792 followed 'La Comedia Nueva,' or 'El Café.' In 1798 he published his translation of 'Hamlet.' In 1803 he wrote 'El Baron' (or the Impostor), in 1804, 'La Mogigata,' and in 1806, 'El Si de las Niñas.' His 'Escuela de los Maridos' (Molière's 'École des Maris,' adapted to Spain and modern times), was not represented till March 17, 1812, under Joseph Bonaparte, who made the author chief royal librarian. On the restoration of Ferdinand in 1814, Moratin's property was seized, and himself reduced to actual starvation. Still, before the close of that year, he was induced to prepare, for the benefit of the actor Blanco of Barcelona, 'El Medico á Palos,' a piece which was modelled on Molière's 'Médecin malgré Lui.' The dread of official and concealed persecutors made him leave Madrid in 1817 for Paris, where he lived with his early friend Melon, till the restoration of the popular Spanish constitution in 1820, when he returned to Barcelona.

He now devoted himself exclusively to the improvement of his own 'Origenes del Teatro Español.' Accompanied by Silvela, he returned in 1827 to Paris, where he died on June 21, 1828, and was buried near Molière's monument in the cemetery of Père la Chaise.

The poetical works of L. Moratin were published by Arnao at Paris, in 3 vols. 8vo., 1825, and reprinted by the same, in 3 vols. 12mo., in the following year. Part of this collection, 'Poesias Liricas de L. Moratin,' was printed in London by Calero, for Salvá, in 1 vol. 12mo., 1825. A splendid edition by the Spanish Academy was published in 1830; but some of his works yet remain in MS. Of his plays, on which his fame mainly rests, there have been numerous editions.

MORAVIA, a province of the Austrian empire, situated between 48° 40′ and 50° 25′ N. lat., 15° 10′ and 19° 6′ E. long., including in these limits the north-eastern districts of Troppau and Teschen, which belong to the basin of the Oder, and form what is sometimes called *Austrian Silesia*. It is bounded N. by Prussian Silesia, W. by Bohemia, E. by Hungary and Galizia, and S. by the grand-duchy of Austria. Its area is 10,543 square miles, and its population in 1842 was 2,223,729. The province is divided into 8 circles, Olmütz, Brünn, Iglau, Znaym, Hradisch, and Prerau in Moravia; and Teschen and Troppau in Silesia. It is traversed by several railroads—the Vienna-Breslau, the Vienna-Prague, and the Vienna-Olmütz-Prague lines; the last two inclose a large portion of Moravia.

Moravia is shut in by the Carpathian mountains on the east, by the Gesenke chain on the north, and by the Bohemian mountains on the west: it is open towards the south, in which direction the Morawa takes its course towards the Danube. The interior is traversed by other chains, so that more than half of the country is mountainous. One of the most remarkable of these latter chains is the range extending from Brünn to Olmütz. It contains numerous caverns and frightful chasms. The mountains inclose fertile valleys, and the central and southern parts of the province consist of extensive plains, the soil of which is extremely fruitful. The rivers are numerous: the largest is the *Marsch*, or *Morawa*, which gives name to the country. This river, the navigation of which is difficult, rises in a cavern on the confines of Bohemia and Glaz, flows in a southern course through the middle of Moravia, receives most of the rivers, especially the Theya or Taya, and leaving the province at the southern point, from which it forms the boundary between Austria and Hungary, falls into the Danube above Pressburg. The Oder rises in the north of the province. There are numerous ponds abounding in fish. Moravia is subject to considerable variation of temperature; it enjoys a milder climate than some other countries in the same parallel.

The animals are horses, oxen, sheep, swine, goats, red deer, hares, feathered game and domestic poultry, especially geese, of which great numbers are exported. With respect to the productions of the soil, Moravia is one of the richest provinces of the empire. Agriculture is in an improved condition. Large quantities of very fine wheat,

rye, barley, and oats are grown. Flax and hemp are very extensively grown; but the consumption of these articles is so great, that large quantities of them are imported. Fruit is plentiful and good. The vine flourishes. The forests furnish vast quantities of timber. The pastures are extensive. Formerly mines of gold and silver were worked. At present iron, sulphur, vitriol, alum, coals, marble, pipeclay, and precious stones, particularly topazes, are the chief mineral products.

The woollen, linen, and cotton manufactures are very flourishing, and on a large scale, and furnish supplies for an extensive export trade. The manufacture of thread is likewise considerable. Dyeing is carried on at Brünn, which is particularly celebrated for dyeing Turkey red. Moravia enjoys also the benefit of a great transit trade. The imports are colonial produce, wool, Vienna silks, Russian furs, tallow, wine, oil, porcelain, glass, &c.

Of the population about 3-fourths are of Slavonic origin and the rest are German. They are all Catholics, except 107,000 Calvinists and Lutherans, and 38,000 Jews. The Roman Catholics of Moravia are under the archbishop of Olmütz and the bishop of Brünn: those of Silesia are under the bishop of Breslau. There is a university at Olmütz. High schools or gymnasia are established in every circle, for those who study the higher branches of learning; the number of elementary schools is very great, and they are attended by 95 per cent. of all the children in the country between 6 and 13 years of age.

The principal towns of the province are the following:—*Olmütz*, lately the residence of the imperial court, a well-built fortified town entered by 4 gates, is situated in 49° 33′ N. lat., 17° 9′ E. long., at a distance of 110 miles by railway N.N.E. from Vienna, and contains about 19,000 inhabitants including the garrison. The university buildings, which contain a library of 50,000 volumes; the cathedral; the town-hall; the archbishop's palace, and the former college of the Jesuits, now a barrack, are the most remarkable structures. *Sternberg*, a municipal town situated in the mountains N. of Olmütz, has 8200 inhabitants, who carry on flourishing manufactures of woollen cloth, linen, canvas, calicoes, and stockings. *Prosznitz*, likewise a municipal town, situated on the Rumza, in the fruitful district of Hanna, of which it is the chief town, has four suburbs and several churches. There are manufactures of fine cloth, kerseymere, and linen, several brandy distilleries, and the greatest corn-market in Moravia. The population is nearly 9000. [Brunn.] *Nicolsburg*, the chief town of an extensive lordship S. of Brünn, has a palace, with a library of 20,000 volumes, a fine cathedral, and several other churches, a gymnasium, and about 8000 inhabitants, of whom about 3000 are Jews. *Iglau*, the capital of the circle of the same name, is a well-built walled town on the river Iglawa. It has 6 churches, a gymnasium, a well-endowed hospital, manufactures of woollen cloth and linen, and a great trade in corn and hops. The population is 14,000. The celebrated fortress of *Spielberg*, in which state prisoners are confined, is in the circle of Brünn. *Hradisch* and *Znaym*, are small places of 2000 and 3000 inhabitants respectively. *Teschen*, situated on the banks of the Olsa, a feeder of the Oder, is a walled town entered by 3 gates. The population amounts to about 6000; they manufacture linen, cloth, firearms, rosoglio, and trade in wool, honey, hides, and wine. *Troppau*, a well-built town on the right bank of the Oppa, a feeder of the Oder, stands in 49° 56′ N. lat., 17° 53′ E. long., and has, together with its 3 suburbs, a population of 16,000. The town, which is surrounded with walls pierced by 4 gates, has several handsome churches, a theatre, a gymnasium, a good library, and considerable manufactures of linen and broad cloth. A branch railway, now in course of construction, joins Troppau to the Breslau-Vienna and Vienna-Warsaw lines. *Bielitz*, N.E. of Teschen, is a well-built town close to the Galizian frontier, with 2 Catholic churches, a Lutheran chapel, an hospital, and about 5000 inhabitants, who manufacture excellent broadcloth and kerseymeres, and also trade in wine and wool.

MORAVIANS, or MORAVIAN BRETHREN, a congregation of Christians descended from the Bohemian Brethren, who were a branch of the Hussites. [Huss, John.] The Bohemian brethren dissented from the Callixtines, and refused to subscribe to the articles of agreement between that party and the council of Basel in 1433. They then formed themselves into a distinct community, called, 'the Brothers' Union,' and as they were obliged to live in seclusion through fear of persecution, they were called by their enemies 'Grübenheimer' or Troglodytes. They looked upon the Scriptures as their rule of faith, rejected transubstantiation, and were very strict in their discipline. Like the Quakers, they refused to do military service.

When the great Reformation took place in Germany, the Bohemian Brethren sent envoys to Luther in 1522, who approved of most of their doctrines and discipline. The Moravians do not assume to constitute a separate sect, and whenever they have been required as a body to state their creed, they have professed a general adherence to the Confession of Augsburg, and their preachers, without pledging themselves to all its articles, reject any doctrine which is utterly repugnant to it. They avoid discussions on the speculative truths of religion; they acknowledge the manifestation of God in Christ, and consider the Saviour as the foundation of their faith. They look upon the Scriptures as the revelation of God. They also believe that the Spirit of God continues to enlighten inwardly those who pray for it for the purpose of regulating their conduct.

The Moravians have settlements in Germany, Switzerland, England, and America. One of their principal objects is to send out missionaries among the heathen. They have missionaries among the Caffres and Betchouanas in South Africa, among the Delaware Indians and the Cherokees in North America, among the Esquimaux of Labrador, and among the negroes of the West Indies.

The Moravians are simple and decent in their

dress, and, like the Quakers, reject all gaudiness and ornament. The unmarried men live in a separate building called the house of single brethren, under the superintendence of an elder; and there are likewise houses for single sisters and widows. Marriages among members of the society must be sanctioned by the elders. They wear no mourning for the dead, looking upon death as a happy release from earthly bonds: their expression on such an event is, that the deceased is gone home to the Lord.

Cranz has written a history of the Moravian or United Brethren.

MORAY or MURRAY FRITH is a gulf of the German Ocean, on the coast of Scotland, bounded N.W. by the counties of Ross and Cromarty, and S.E. by those of Nairn and Elgin. The north-western shore of the Frith extends nearly in a straight line from Kessock Ferry, opposite the town of Inverness, to Tarbet-Ness, the north-western extremity of Rossshire, a distance of 32 miles. The south-eastern shore extends from the town of Inverness to Fort George, and thence to Burghead on the coast of Elginshire. The ports along this shore are merely tide havens. The distance of Burghead from Tarbet-Ness is 15 miles, which may be considered the width of the frith at its entrance.

MORAYSHIRE. [ELGINSHIRE.]

MORBIHAN, a department in France, formed out of a portion of Lower Bretagne, is bounded N. by Côtes-du-Nord, E. and S.E. by Loire-Inférieure, S. and W. by the Bay of Biscay and the department of Finistère. A shallow inland sea (the *conclusum mare* mentioned by Julius Cæsar in the account of his fierce campaign against the Veneti, 'Bell. Gall.,' iii. 7–16), which communicates by a narrow channel with the Bay of Biscay, and extends far inland to the S. and W. of Vannes, inclosing several small islands, is called *Mor-bihan*, from two Celtic words, signifying the *little sea:* hence the department takes its name. From N.W. to S.E. the department is 82 miles in length; its mean breadth is about 41 miles. The area is 2701 square miles, and the population in 1846 was 472,773; which gives 175.03 to the square mile, being 1.28 above the average per square mile for all France.

The north of the department is covered by heath-clad hills, which slope down gradually towards the south into vast and fertile plains. The coast, exposed to the continuous action of a violent sea, is rent by a great number of bays, roadsteads, and harbours, the most important of which are those of Lorient, Port-Louis, Auray, Vannes, and Hennebont. The most remarkable headland is the peninsula of *Quiberon*, which extends southwards nearly 10 miles into the sea, and is connected with the mainland by an isthmus, only 66 yards across, and so low that storm and spring tides sweep over it. On the western side of this peninsula is the bay of Quiberon, which affords good anchorage for vessels of all sizes, and is defended by the guns of Fort Penthièvre, built on the isthmus. The numerous inlets and harbours along the coast give great facilities for the coasting and foreign trade. The soil of the department is for the most part light, except near the coast, where it is strong, deep, and fertile. Very nearly half of the surface of the department is covered with heaths and moors. There are several islands along the coast, the chief of which are—BELLE-ILE, Groix, Houat, and Hœdic, in the Bay of Biscay; and those of Aux-Moines and Arz in the Morbihan. Scarcely a commune in the department is without some druidical stones or monuments. Half a mile from *Carnac*, a large village near Auray, one of the most remarkable of these monuments is found. It is situated in a vast plain, and consists of more than 1200 large unhewn stone blocks, varying from 5 to 24 feet in height, arranged in 11 parallel lines, which extend from S.E. to N.W., a length of 1676 yards, with a breadth of 103 yards, and terminate to the north-west in a curve, approaching to a semicircle. Many of the stones seem to have been broken; others have fallen from the upright position in which it is supposed that all of them were originally placed.

The people speak a dialect of the ancient Celtic language, but most of them understand French, and speak it however incorrectly. In manners, habits, and mode of life, they resemble their neighbours of FINISTE'RE.

The department is traversed by a great number of small rivers, some of which are navigable by means of the tide to a short distance from their mouths. The principal of them are—the *Blavet*, which flows in a general southern direction from the department of Côtes-du-Nord, and enters the sea below Lorient, having a tide navigation up to Hennebont: the *Oust*, which flows S.E. from Côtes-du-Nord, and enters the Vilaine on the eastern boundary: the Vilaine [ILLE-ET-VILAINE]: and the *Auray*, which falls into the Morbihan, where it forms the harbour of the town of Auray. The department is traversed by the Nantes-Brest canal, which runs along the course of the Oust, and then crosses into the Valley of the Blavet at Pontivy; and by the canal which renders the Blavet navigable from Hennebont to Pontivy. It is also traversed by 7 royal and 13 departmental roads.

The temperature is mild, but fogs are frequent; the prevalent wind is the south-west. The itch, which used to be endemic among the inhabitants of the north-west of the department, has been of late years almost wholly eradicated from amongst them.

Bread-stuffs, more than enough for the home consumption are produced; the surplus exported amounts to about 300,000 qrs. Lentils, turnips, flax, hemp, and cider apples are also cultivated. Of wine the department yields little, and that little is bad. The common domestic animals are bred in considerable numbers. Bees are numerous, and the honey of the department is highly prized. Water-fowl and fish are abundant. The sardine fishery along the coast is very profitable, affording employment to above 3000 men, and yielding annually about 1,500,000 francs. A good deal of salt is made by evaporation at several points on the sea-shore.

Iron and tin mines are worked; lead is found

granite, building-stone, slate, rock-crystal, potter's clay, &c., are quarried.

Linen is the chief manufacture; corn, iron, woollen stuffs, canvass, porcelain, cotton yarn, paper, and leather, are made; ship-building is carried on. Corn, brandy, cider, fruits, butter, tallow, salt, honey, wax, hemp, cattle, salt-fish, hides, iron, fish-oil, &c., are the chief articles of commerce. Above 600 fairs are held.

The department contains 1,728,913 acres, distributed among 123,917 proprietors, and into 1,893,504 parcels. Of this surface 666,555 acres are under cultivation; 170,637 acres are grass-land; 88,372 are covered with woods and forests; 41,713 acres are laid out in gardens, orchards, and plantations of different sorts; 720,415 acres consist of heaths and moor-land; and 15,740 acres are occupied by rivers, marshes, and canals.

The department is divided into 4 arrondissements, which, with their subdivisions and population, are as follows:—

Arrond.	Cantons.	Communes.	Pop. in 1846.
Vannes . . .	11	72	129,816
Pontivy . . .	7	46	106,433
Lorient . . .	11	52	146,212
Ploërmel . . .	8	57	90,312
Total . .	37	227	472,773

Of the arrondissement of Vannes, and of the whole department, the chief town is *Vannes*, the capital of the ancient *Veneti*, which stands at the head of an inlet from the bay of Morbihan, in 47° 39′ 31″ N. lat., 2° 45′ 42″ W. long., at a distance of 285 miles W. by S. from Paris, and has 11,737 inhabitants. The principal part of the town is built on the top and southern slope of a hill above the Marle, a river that runs into the Morbihan; a portion of it extends also into the valley, the houses being built on piles. Vannes has an appearance of great antiquity, which is not diminished by its dark narrow streets, overhanging houses, massive ramparts, and gate-entrances, four only of which out of six now remain. The most remarkable buildings are—the cathedral, and a tower, which stands in the centre of the town, and is the only remaining vestige of the Château de l'Hermine, built in 1387. There is a small harbour lined with quays, but capable of admitting small craft only. One side of the harbour is planted with trees, and forms a fine promenade; on the other side are ship-building yards. Other objects of note in the town are—the prefect's hotel, the bishop's palace, the barracks, three hospitals, the public library of 8000 volumes, and the promenade called Cours de la Garenne. Vannes gives title to a bishop; it has tribunals of first instance and of commerce, theological and communal colleges, and a school of hydrography. Coarse woollen cloth, linen, calico, lace, ironmongery, leather, paper, beer, and salt are the chief industrial products; of these and of corn, hemp, butter, wax, honey, cider, brandy, and Bordeaux wines, the commerce of the town consists. *Carentoir*, on the eastern boundary of the department, is a large market town, with above 5000 inhabitants. *Elven*, 10 miles N.E. of Vannes, has a population of 3320, and is famous for its feudal castle, one of the best preserved monuments of the middle ages in Bretagne. The church of St.-Alban, and the ossuary or reliquary, situated in the adjacent cemetery, are deserving of notice. *Grand-Champ*, W. of Elven, is built on a height, and possesses a church with a very high tower, which formed the vertex of one of Cassini's triangles; the population of the town, which was the scene of two severe actions between the Republicans and the Chouans in 1795 and 1800, is 4833. *Mucillac*, S.E. of Vannes, has 2236 inhabitants. *Questembert*, E. of Vannes, is an old ill-built town, with 3590 inhabitants, who manufacture leather, and trade largely in butter. *Roche-Bernard*, a small town and port, with 1300 inhabitants, near the mouth of the Vilaine, requires mention on account of the fine iron-wire suspension bridge which here spans the river. This bridge, 649 feet in span, and 108 feet above high-water mark, is approached by three lofty arches, and supported on two piers of granite masonry. *Sarzeau*, the birth-place of Le-Sage, is situated on the peninsula of Ruis, on the south side of the Morbihan, and has 6901 inhabitants, mostly sailors.

In the arrondissement of Pontivy, the chief town, *Pontivy*, is situated on the left bank and on the canal of the Blavet, 30 miles N. by W. from Vannes, and has a tribunal of first instance, a college, and 7018 inhabitants. The remains of old walls, pierced by 4 principal gates, show that this town was once strongly fortified. The new part of the town lies without the line of the old fortifications; it is laid out in straight broad streets, and contains a prison and cavalry barracks, with a fine manœuvring ground. In the old town the most remarkable building is the old castle of the dukes of Rohan, which was rebuilt in 1485. Pontivy is a place of considerable commercial activity: corn, linen, thread, hides, butter, horses, cattle, and leather, are the principal items of its trade. This town took the name of Napoléonville during the empire. *Baud*, a market-town, with 4737 inhabitants, stands in a valley at the intersection of three great roads, 12 miles S. from Pontivy. The chapel of Notre-Dame-de-la-Clarette, built close to a fountain in the environs of the town, and the statue of the Armorican Venus called Venus de Quinipili, which stands on a pedestal on a hill near the town, are worthy of notice. *Cléguérec*, 5 miles N.W. of Pontivy, has a population of 3434. *Le-Faouet*, situated in the north-west of the department, stands on the top of a hill at the intersection of four high roads which abut on a square in the centre of the town. The inhabitants, who number 3000, manufacture Prussian blue, and paper; and trade in agricultural produce. *Gourin*, N. by W. of Le-Faouet, also stands on a hill, and has 3783 inhabitants.

Of the arrondissement of Lorient, the chief town, LORIENT, has been already noticed. *Auray*, situated on a hill at the mouth of the river Auray, 16 miles E. from Lorient, has a harbour for moderate sized vessels, a handsome quay, several

shipbuilding yards, and 3815 inhabitants, who are engaged in the coasting trade, the fisheries, and the manufacture of lace, cotton twist, tiles, bricks, &c. *Hennebont*, famous for its defence by Jeanne de Montfort against Charles of Blois in 1341, and built on the slope of two hills, separated by the Blavet, which is here crossed by a bridge, consists of three parts—the old town, the new town, and the walled town. The old and the new town, which make up three-fourths of the city, consist of narrow steep streets, remarkable only for some old houses of gothic architecture, and for the dirt-heaps that poison the air in front of every door. The walled town still retains the greater part of the fine ramparts with which it was formerly girt; it was formerly defended by a strong castle, of which only a single gate now remains. The Blavet forms a port, to which vessels of small size ascend. The town has 4552 inhabitants, who trade in corn, wine, honey, cider, hemp, hides, iron, &c. Shipbuilding is carried on. Hennebont has an important corn-market. *Plouay*, a considerable market town N. of Lorient, has a population of 4047. *Pluvigner*, 16 miles E. from Lorient, has iron smelting furnaces and forges; foundries for bullets, bombs, and other projectiles; and 4695 inhabitants. *Port-Louis*, a small ill-built town, with narrow winding streets, stands at the entrance of the roadstead of Lorient, and has a population of 3139. It is surrounded by ramparts and defended by a strong citadel, which commands the entrance of the roadstead. The harbour is large and deep enough for men of war; the holding-ground is good, but the entrance is rather difficult. The parish church and the barracks are the most remarkable structures. *Quiberon*, a large village with 3013 inhabitants, stands at the extremity of the peninsula of Quiberon, famous for the unfortunate expedition of the Count of Artois in 1795.

In the arrondissement of Ploërmel, the chief town, *Ploërmel*, situated near the lake and river Duc, which flows into the Oust, in the east of the department, has a tribunal of first instance, a college, and 4987 inhabitants, who trade in woollen cloth, hempen yarn, linen, flax, honey, iron, and cattle. The town is well built, with wide clean streets; it has two squares, a large fair-green, and an hospital. The court-house, the parish-church (a remarkable structure of the 12th century), and the church of the former Ursuline convent, are the most striking of the public buildings. *Josselin*, 6 miles W. by N. from Ploërmel, has 2756 inhabitants. It is famous for its ancient castle, in which Olivier de Clisson, Constable of France, died (April 20, 1407), and which has been recently repaired by the duke de Rohan. The parish church contains the tombs of de Clisson and his wife Marguerite de Rohan, which were destroyed in 1793, and rebuilt in 1830. Between Ploërmel and Josselin is the heath of *Mi-voie*, famous for the combat between 30 Bretons and 30 English, on the 27th of March, 1351, when the latter were defeated; the spot is now marked by a granite obelisk, erected in 1819, and inscribed with the names of the 30 Bretons. *Guer*, a market-town of 3773 inhabitants, 12 miles E. from Ploërmel, owes its origin to a hermitage frequented by St. Malo, about the year 541, and over which the parish church is now built.

The department forms the see of the bishop of Vannes; is included in the jurisdiction of the High Court and University Academy of Rennes; and belongs to the 13th Military Division, of which Rennes is head quarters. Under the monarchy it returned 6 members to the Chamber of Deputies; it now has 10 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1849.)

MORCELLI, STE'FANO ANTO'NIO, born at Chiari, near Brescia, in 1737, studied at Rome, entered the Order of the Jesuits, and afterwards became Professor of Rhetoric in the Roman College. After the suppression of the Order of the Jesuits in 1773, he became librarian to Cardinal Alessandro Albani, and then wrote his great work 'De Stilo Inscriptionum Latinarum Libri III.' In 1790 he was elected Provost of the Chapter of his native town, Chiari, where he distinguished himself by his benevolence, and where he died in 1821.

Morcelli wrote several works on Inscriptions, which have been collected and published together: 'Opera Epigraphica,' Padua, 5 vols., 1818-25, and Professor Schiassi has added to them a 'Lexicon Epigraphicum Morcellianum,' in Latin and Italian. Morcelli wrote also a book of epigrams —'Electorum Libri II.;' and various works on theological history and Roman antiquities.

MORDANTS. [Dyeing.]

MORDAUNT, CHARLES, *Earl of Peterborough*, was the son of John Lord Mordaunt. He was born in 1658. In his boyhood he served in the navy, but afterwards exchanged that profession for the army, and was present in 1680 at the siege of Tangier. He first obtained notice by the part he took, during the reign of James II., against the despotic government of that king. He attached himself to the Prince of Orange, and, on his accession to the crown of England, was created, in 1689, Earl of Monmouth, a title which he subsequently exchanged for that of Earl of Peterborough, as the heir of his uncle, second earl of the latter name. Of his comparatively unimportant share in the political transactions of the reign of William III. an account is given in Bishop Burnet's 'History of his own Time.' He was appointed in 1705, to the command of a naval squadron and body of 5000 English and Dutch land forces, with discretionary powers to act on the coasts of Spain and Italy. Accompanied by the archduke Charles of Austria, claimant of the Spanish crown, he sailed to the eastern coast of the Peninsula, and entered on a career of daring and successful adventure unparalleled in modern warfare. The capture of Barcelona, the reduction of Valencia, and the gaining over of all the eastern parts of Spain to the cause of the archduke, were among the fruits of his brilliant successes. But he thought himself neglected, and retired from Spain, when the fruits of his conduct were soon lost. In the struggle of parties, during the last days of Queen

Anne, Peterborough, through hatred to Marlborough, sided violently with the Tories, and received the order of the Garter and other dignities and offices. The remainder of his existence, which extended to 1735, was distinguished by his affectionate intimacy with Pope, Swift, Prior, Atterbury, Berkeley, and others.

A lively sketch of the character of the Earl of Peterborough will be found in Horace Walpole's 'Catalogue of Royal and Noble Authors.'

MORE, SIR THOMAS, born in Milk Street, London, in 1480, was the son of Sir John More, one of the justices of the Court of King's Bench. He was educated at St. Anthony's School in Threadneedle Street, and about his 15th year was placed in the house of Cardinal Morton, archbishop of Canterbury, where he became known to Colet, dean of St. Paul's, who used to say, 'there was but one wit in England, and that was young Thomas More.'

In 1497 More went to Oxford, where he studied Greek, made the acquaintance of Erasmus, and composed the greater number of his English poems. After he left Oxford he prosecuted the study of the law, and soon acquired great celebrity for his legal knowledge. More appears to have soon acquired an extensive practice. He was appointed one of the under-sheriffs of London, and his reputation became so great towards the latter part of the reign of Henry VII., that it is said there was no case of consequence in which he was not engaged as counsel.

After the accession of Henry VIII., More was called upon to take a more active part in public affairs. In 1514 and 1515 he was sent to Bruges on business of considerable importance. In 1516 he was made a privy-counsellor, and received from Henry marks of the greatest favour.

About this time More composed his 'History of Richard the Third,' and his 'Utopia.' The 'Utopia' is written in very good Latin, and was published first at Louvain in 1516, and afterwards at Basel, in 1518.

In 1519 he resigned his office of under-sheriff, and in 1521 was knighted, and made treasurer of the Exchequer. He was frequently employed by Henry in various public missions to France and the Netherlands. In the parliament which met in 1523 More was chosen speaker, and in the discharge of his duties he offended Wolsey. Henry however still continued to show the greatest marks of favour to More, and appointed him, in 1525, chancellor of the duchy of Lancaster.

On the downfal of Wolsey, More was made chancellor, on Oct. 25, 1529. The only charge ever brought against him was first promulgated by Fox, in his 'Martyrology,' who accused him of great cruelty in persecuting the Protestants; but we have the testimony of Erasmus, that 'whilst More was chancellor no man was put to death for these pestilent dogmas,' which is confirmed by More's own express declarations in his 'Apology,' published in 1533.

More continued chancellor till May 16, 1532, when, rather than enter into the king's designs to procure a divorce from Catherine and a marriage with Ann Boleyn, he retired from his office. From this time Henry appears to have resolved upon the destruction of his old favourite. By a law passed in the session 1533–4 it was made high treason, by writing, print, deed, or act, to do anything to the prejudice, &c., of the king's lawful matrimony with Queen Anne; and it was also provided that all persons should take an oath to maintain the whole contents of the statute. At the end of the session commissioners were appointed to administer the oath, and on April 15, 1534, More was summoned before them to take it. More declined to take this oath, was committed to the Tower, tried for high treason, and beheaded on July 6, 1535. More was twice married.

The English works of Sir T. More were collected and published at London in 1557, and his Latin works at Louvain in 1556. His letters to Erasmus are printed in the collection of Erasmus's letters published at London, 1642. His 'Utopia' has been translated into English by Robynson, London, 1551, by Bishop Burnet, and more recently by Arthur Cayley, London, 1808.

MORE, HENRY, was born at Grantham in Lincolnshire, in 1614. He was sent to Eton, and afterwards to Christ's College, Cambridge. At college he devoted himself with great zeal to the study of philosophy, and particularly to that of Plato. He took his degree of B.A. in 1635, and of M.A. in 1639. In 1640 he published his 'Psychozoia, or the First Part of the Song of the Soul, containing a Christiano-Platonical Display of Life,' which was reprinted in 1647, and, together with some additional pieces, published under the title of 'Philosophical Poems.' He had been elected in the mean time a Fellow of Christ College. His next work was the 'Conjectura Cabalistica.' He was one of the first Fellows of the Royal Society. He died in 1687.

More's chief works, in addition to those which have been mentioned, are—'The Mystery of Iniquity,' 'A Key to the Revelations,' 'Enchiridion Ethicum,' 'Enchiridion Metaphysicum,' 'An Apology for Descartes,' and 'The Immortality of the Soul.'

MORE, HANNAH, born 1745, died 183[illegible] was the daughter of a village schoolmaster, near Bristol. She wrote verse at a very early age, and in 1773 published a pastoral drama, entitled 'The Search after Happiness.' In the next year she published a tragedy on the story of Regulus, which occasioned her to be introduced to Garrick and subsequently to Dr. Johnson, Burke, Sir Joshua Reynolds, and other persons who at this time formed what was considered the best literary society of London. During this period of her life she produced two tragedies, 'Percy' and 'The Fatal Falsehood,' besides some poems.

But her devotional feelings led her to be dissatisfied with her position, and impelled her to wish to retire from London, and to devote herself to the cause of religion. Whilst aiming at this end she produced her 'Sacred Dramas,' which were very favourably received by the public. In the year 1786, she effected her plan for retiring into the country, and at Barleywood in Gloucestershire, and Clifton near Bristol, the rest of her life was passed. She died at Clifton, Sept. 7, 183[illegible]

We cannot undertake to enumerate all the publications of Miss More. The work in which the serious turn which her mind had taken first manifested itself was her 'Thoughts on the Manners of the Great,' 1788; which was followed in 1791 by the 'Estimate of the Religion of the Fashionable World.' In 1799 appeared her 'Strictures on the Modern System of Female Education.' Soon after appeared 'Cœlebs in Search of a Wife.' In 1811 her 'Practical Piety' appeared; in 1812 her 'Christian Morals;' in 1815 her 'Essay on the Character and Writings of Saint Paul.' She was the writer also of one of the first of the 'Cheap Repository' tracts, 'The Shepherd of Salisbury Plain.'

MORE'A, the ancient Peloponnesus, a large peninsula forming the southern part of Greece, and united to the mainland by the isthmus of Corinth. Its shape has been compared to that of a mulberry leaf, and its coast, being deeply indented by numerous gulfs and inlets, forms a multitude of small peninsulas and promontories. The greatest length of Morea from the point of Drépanum on the straits of Lepanto, to Cape Matâpan, its most southern promontory, is 140 miles; and its greatest breadth, from the coast opposite Zante to the easternmost coast of Argolis, near Poros, is about 125 miles. The area probably exceeds considerably 9000 miles..

The centre of Morea forms an elevated table-land traversed by numerous ridges of hills, which inclose spacious basins. On the west of the table-land the valleys have a long slope along the course of the Alpheus and its tributaries, until they merge into the low maritime plains of Elis. On the east of the table-land the descent is rapid. Towards the south the long valley of the Eurotas slopes down to the coast beween two ranges of mountains, which detach themselves from the central highland, and, projecting into the sea, form the promontories of Malea and Tænarum. Westward of the valley of the Eurotas is the valley of the Pamisus, in Messenia.

On the north side the table-land of Morea is separated from the maritime district of Achæa by a range of mountains known to the ancients by the names of Erymanthus, Lampe, and Cyllene. For a further description of the surface of the country, see ACHÆA, ARCADIA, ARGOLIS, ELIS, LACONICA, and MESSENIA.

The highest summits of Morea, Taýgetus in the South and Cylléne in the north, are reckoned to be somewhat above 5000 feet; and snow remains on the highest points of the Taýgetus till the month of June. The table-land of Arcadia is often covered with snow in March, while the maritime districts enjoy warm and genial weather. The atmosphere of Morea is generally pure, the landscape beautiful, and the ground in the valleys and low plains fertile. The mountains afford good pasture, and although the forests have been sadly wasted, still many parts of the mountains are covered with fine pines and oak trees. The country produces grain, wine, oil, flax, currants, and most other fruits; and feeds numerous flocks of sheep. The principal towns are—Patras, on the north coast; Gastouni, Arkadia, Navarino, and Modon, on the west coast; Koron and Kalamata, on the south coast; Monembasia, Nauplia, and Argos, besides the islands of Spezzia, Hydra, and Poros, on the east coast; and the towns of Mistra, Tripolitza, Karitena, Kalavrita, and Adritzena, in the interior. The Morea is now a part of the kingdom of Greece.

MOREAU, JEAN VICTOR, was born in 1763, at Morlaix in Brittany, of respectable parents. He entered the army at 18 years of age, and when the Revolution broke out he accepted the command of a volunteer legion of the Breton youth, and joined the army of the North. He soon attracted the notice of Pichegru, and rose in two years to the rank of general of division. In this capacity, in the campaign of 1794, he signally distinguished himself at the head of a separate corps of 25,000 men, by the rapid reduction of several strong places in Flanders.

After assisting Pichegru in the conquest of Holland, Moreau was appointed commander-in-chief of the army of the Rhine and Moselle, and opened the campaign of 1796 by the defeat of the Austrian general Wurmser. The archduke Charles of Austria met with no better success, until the Austrians were reinforced, and Moreau then finished this campaign by a masterly retreat through the defiles of the Black Forest.

At the commencement of the next campaign, Moreau became suspected of being concerned in Pichegru's conspiracy, and, though he denied it, he solicited and obtained leave to retire from the army. His services however were too necessary to be long dispensed with; and he was again actively employed, both in Italy and on the Rhine.

On Bonaparte's return from Egypt, Moreau proffered and rendered him his services in effecting the revolution of the 18th of Brumaire. He soon afterwards received the command of the armies of the Danube and Rhine, and won from the Austrians the battle of Hohenlinden in 1800. Bonaparte praised him, but looked on him as a rival, and in 1804, being charged with having been a party to the royalist conspiracy of Pichegru and Georges Cadoudal, he was condemned to an imprisonment for two years, which, by his own request, was commuted into banishment. He retired to America, where he lived tranquilly, with his wife and child, for several years, until he accepted, in 1813, a proposal from the Russian emperor Alexander to assist the allied armies by his counsels against his country. He had scarcely arrayed himself in their ranks when he was mortally wounded at the battle of Dresden, and died in a few days, after bearing the amputation of both legs without a groan.

MOREL is an eatable fungus, called by botanists *Morchella esculenta*. It springs up in orchards, woods, and cinder-walks, early in the spring and summer, and is believed to be most plentiful in places where fires have been made. The country people in Germany were so persuaded of this, that they formerly set fire to woods in order to obtain a crop of morels, of which they are very fond.

MORELL, THOMAS, born at Eton in 1703, studied first at Eton College, then at Cambridge, where he became a Fellow of King's College, and in 1743 took his degree of D.D. He edited several tragedies of Æschylus and Euripides with notes. He also edited improved editions of the Greek Lexicon of Hederick, and of Ainsworth's Latin Dictionary. His 'Thesaurus Græcæ Poëseos, sive Lexicon Græco-Prosodiacum,' 4to., 1762, has been republished, with considerable additions, by Dr. Maltby, Cambridge, 1815.

MORELLI, CO'SIMO, an architect, was born at Imola in 1732. He studied under Domenico Trifogli. He successively erected the cathedral of Imola, the metropolitan church at Fermo, the duomo at Macerata, and the conventual church at Fossombrone, St. Petronio at Castel Bolognese, a church at Barbiano, that of the nuns of St. Chiara at Imola, and St. Maria in Regola in the same city, and another church at Lugo; the theatres of Imola, Fermo, Jesi, Osimo, and Ferrara; the Palazzo Braschi at Rome, the Anguisola at Piacenza, the Berio at Naples, and the Cappi at Bologna. He died in February, 1812.

MORELLI, GIACOMO, was born at Venice April 14, 1745. He was the son of poor parents, who could not afford to give him a liberal education. He afterwards supplied the deficiencies of his education by private study, and entered the church, but gave his whole attention to the study of books. He published a catalogue of the rich collection of his friend Farsetti, and subsequently catalogues of the library of the academy at Padua, of the MSS. of ancient writers in the Narni library; and in 1788 he was made librarian of the library of St. Mark, which office he held till his death in 1819. In 1795 he discovered a considerable fragment of the 55th book of Dion Cassius, which he published at Bassano. The work which exhibits his extensive knowledge and his critical acumen in the strongest light, is his 'Bibliotheca Manuscripta Græca et Latina.'

MORENA, SIERRA. [Andalucia; Castilla-la-Nueva.]

MORE'RI, LOUIS, born in Provence in 1643, studied at Aix and Lyon, and became doctor of divinity. He published in 1673 his 'Grand Dictionnaire Historique et Critique.' Moreri undertook a new edition of his Dictionary, of which he published the first volume, but the second was not entirely printed when he died in 1680.

Numerous editions of his Dictionary, revised and enlarged, have appeared; the last is that of Paris, 1759, in 10 vols. fol. Moreri published also 'Rélations Nouvelles du Levant, ou Traité de la Religion, du Gouvernement, et des Coutumes des Perses, Arméniens, et Gaures.'

MORETON HAMPSTEAD. [Devonshire.]

MORGAGNI, GIOVANNI BATTISTA, was born at Forli in 1682. He studied medicine at Bologna, and in 1701 obtained his doctor's degree. He afterwards went to Venice and to Padua, to study chemistry and natural philosophy, and in 1715 he was appointed chief professor of anatomy in the University of Padua. He died in 1771.

Morgagni's chief works are, 'Adversaria Anatomica Prima,' 1706; 'Epistolæ Anatomicæ,'—amounting altogether to twenty, which were published together at Venice in 1762. He edited also the life and works of Valsalva, his former preceptor and friend, whose opinions he constantly and warmly maintained. But Morgagni's most celebrated work was that which he first published in his eightieth year, 'De Sedibus et Causis Morborum per Anatomen indagatis,' Venice, 1761, in 2 vols. folio, which contains records of an immense number of observations on morbid anatomy, and which conferred nearly as great benefit on pathology as the contemporary works of Haller conferred on physiology. It has been since frequently republished and translated, and is still a standard work of reference.

MORGARTEN. [Zug.]

MORGHEN, RAPHAEL SANZIO, Cavaliere, was born at Florence, June 19, 1758. Morghen's father was an engraver, and from him Morghen received the rudiments of his artistic education. His first engravings of consequence were seven plates from the masks of the carnival of 1778, and the Pilgrimage of the Grand Signor to Mecca. The excellence of these works induced his father to send him to Volpato at Rome, where he made rapid progress; and in 1781 engraved Raphael's allegoric figures of Poetry and Theology. In the same year he married Volpato's daughter. In 1787 he engraved the Aurora, painted in fresco by Guido; but this, though one of his principal works, is not one of his best. In 1792 the Neapolitan court offered him a salary of 500 ducats to reside at Naples; but Morghen accepted in preference an invitation from the Grand Duke of Tuscany to Florence, with a salary of 400 scudi and free apartments in the city, under the sole condition that he should keep a public school.

The first print engraved by him in Florence was the Madonna della Seggiola. In 1795 he commenced the celebrated Madonna del Sacco after Andrea del Sarto, and Raphael's Transfiguration. The Transfiguration was not completed until 1812, when it appeared with a dedication to Napoleon, and the emperor invited the engraver to Paris, and honoured him with various presents. Morghen was engaged while this work was in progress, three years, upon a print of the Last Supper by Lionardo da Vinci and this is his masterpiece: it was made from a drawing by Teodoro Matteini.

Raphael Morghen died at Florence, April 8 1833. His pupil Palmerini published at Florence in 1824, a life and portrait of him, with a list of his works. Morghen has engraved, according to this list, 73 portraits; 47 biblical and religious pieces; 44 historical and mythological pieces 24 views and landscapes; and 13 vignettes and crests, &c.; in all 201 pieces.

MORHOF, DANIEL GEORG, was born at Wismar, in Mecklenburg-Schwerin, Feb. 6, 1639 Young Morhof was taught the Latin rudiments by his father. In 1655 he was sent to the Royal Pädagogium of Stettin; whence after two years he proceeded to the university of Rostock to study law. He continued however to compose

verses in Latin and German with great facility, and much to the admiration of his friends. In 1660 he obtained the professorship of poetry in the university. He was made doctor of laws by the University of Franeker, in Friesland, on Sept. 26, 1661. He greatly distinguished himself by the manner in which he performed the duties of his professorship; and in 1665 he accepted the appointment of Public Doctor of Eloquence and Poetry to the university of Kiel in Holstein.

In 1673 Morhof succeeded to the professorship of history; and in 1680 he was appointed librarian to the university. In 1690 he was attacked by a serious illness, and died at Lübeck, July 30, 1691, on his way back from Pyrmont, whither he had gone to try the waters.

Morhof was a very voluminous author. The account of his writings, published and unpublished, fills nearly fifty pages of the Memoir by his friend Moller. Of all the mass of authorship to which his name is attached, his 'Polyhistor' is, we believe, the only portion that is still held in any esteem. The full title of this work is 'Polyhistor Literarius, Philosophicus, et Practicus.' A new edition of the whole work was produced in two vols. 4to., by John Albert Fabricius, in 1731; and another edition in 4to., by the same editor, in 1747. All the editions have been published at Lübeck. With the ample indexes of Fabricius, and with the corrections and additions which it has received from his extensive and accurate learning, the 'Polyhistor' is still a useful survey of universal literature down to the middle of the last century.

MORISCOS, the Spanish name for the descendants of the Moors who remained in Spain after the taking of Granada in 1492. By the terms granted to the city of Granada the Moorish inhabitants of Spain were to retain their own religion, laws, customs, language, and national dress. These terms were soon disregarded by the conquerors, and means were taken to make the Moors adopt the religion of the cross. For this purpose persuasion was first tried and failed; then the powers of the Inquisition were extended, and many thousands of Moors, brought before it under a charge of infidelity, were put to death. The great bulk of the unfortunate people however outwardly professed Christianity, in order to save their lives and property. But by a royal decree, dated Sept. 1556, the New Christians, as the Moriscos were sometimes called, were ordered to learn and use the Spanish language; their Arab books were condemned to be burnt; the Christian dress was to be adopted; the Moorish women were to go about the streets *unveiled;* and the men were to renounce their Mohammedan and adopt Christian names. This decree led to a fierce insurrection in the Alpujarras, which was not put down till 1570. Finally, as neither persuasion nor force was able to make them sincere Christians, the Moriscos, to the number of 800,000, were conveyed in the royal galleys from Spain, and landed on the shores of Africa, according to a decree of Philip III. in 1610; and thus Spain was deprived of one of the most industrious portions of her population—a blow from which she has never recovered.

MORLAIX. [FINISTE'RE.]

MORLAND, SIR SAMUEL, was the son of the Rev. Thomas Morland, of Sulhamstead-Bannister, near Reading in Berkshire, and born about the year 1625. He received his education at Winchester school and at Cambridge. Soon after his departure from college, he accompanied Whitelock on his embassy to the queen of Sweden. On his return, he became assistant to Thurloe, the secretary of Oliver Cromwell; and he is said, but not on conclusive evidence, to have become aware of Sir Richard Willis's plot for securing the person of Charles II. by a deceptive invitation to England, which he communicated to the king at Breda, and thus avoided the snare. In May, 1660, he went to the king at Breda, who received him kindly, made him a knight, and soon afterwards a baronet.

On the restoration of Charles he was made master of mechanics to his Majesty, and was soon afterwards made a gentleman of his Majesty's privy-chamber. He died, December 30, 1695, at Hammersmith. The last three years of his life were spent very wretchedly. Poverty and loss of sight compelled him to rely almost solely on the charity of archbishop Tenison. He was quite blind for some time before his death.

Sir Samuel was distinguished by his mechanical and mathematical knowledge. He prepared and partly printed a work on the quadrature of curvilinear spaces, but was persuaded to lay it aside by his friend Dr. John Pell. In 1616 he seems to have invented his arithmetical machine, but he did not publish an account of it before 1673, when, 'by the importunity of his very good friends,' it was made public. His 'Perpetual Almanac' is given at the end. We are indebted to him also for the speaking-trumpet in its present form, an account of which useful instrument he published at London in 1671, under the title of 'A Description of the Tuba Stentorophonica, an instrument of excellent use as well by sea as by land.' The invention excited much interest at the time; so Butler makes Hudibras say,

> 'I heard a formidable voice,
> Loud as the Stentophonic noise.'

There is one of Morland's original trumpets, now preserved in Trinity College Library, Cambridge, about six feet long. He very greatly improved the fire-engine, or 'quench-fire,' as Evelyn called it. The principal objects of Sir Samuel's study were water-engines, pumps, &c., which he carried to a high degree of perfection: his pumps brought water from Blackmore Park, near Winkfield, to the top of Windsor Castle. There is also a treatise by Sir Samuel, in the Harleian collection of manuscripts, which is entitled 'Elevation des Eaux, par toute sorte de Machines, reduite à la mesure, au poids, et à la balance: Presentée à sa Majeste tres Chrétienne,' 1682: at page 25 commences a very short tract on the steam-engine, entitled 'The Principles of the New Force of Fire invented by Chev. Morland in 1683, and presented to his most Christian Majesty, 1683.

In 1658 he published his 'History of the Evangelical Churches of Piedmont,' and he wrote treatises on military discipline and fortification, and on the barometer. The invention or rather the improvement of the capstan, and several other mechanical contrivances, have also been ascribed to him. In the library at Lambeth Palace is an autobiography of Sir Samuel Morland, written by him in the latter part of his life.

MORLAND, GEORGE, was the son of Henry Robert Morland, an indifferent painter, from whom he received his first instruction. He first painted landscapes and one or two small conversation pieces: his favourite subjects however were domestic animals, horses, dogs, pigs, &c., which he painted in a masterly manner. Morland was a master of the mechanism of the art. With a correct eye for effect, he observed and executed with equal rapidity; and though he was without imagination, he rendered his subjects interesting by faithful expression of their essential character and picturesque arrangement. Morland was born in 1764, and died in 1804.

MORLEY, THOMAS, a distinguished early composer, and author of the first regular treatise on the art of music that appeared in the English language, was born probably about the middle of the 16th century; our information concerning him is indeed remarkably scanty, the celebrity of his works being considered. All that is known of this eminent professor is gathered from Wood, who, in his 'Athenæ Oxonienses,' tells us that he was a disciple of Birde, to whom he dedicated his book in very reverential and affectionate terms; that he obtained a bachelor's degree in 1588, and was sworn into his place as gentleman of the Royal Chapel in 1592. He died, Dr. Burney supposes, in or near the year 1604.

Morley's compositions include the fine 'Funeral Service,' the first that was set to the words of our reformed Liturgy; and 'Consort Lessons, made by divers exquisite authors, for six different instruments to play together, viz. the Treble Lute, Pandora, Citterne, Base-Viol, Flute, and Treble-Viol.' He edited that collection so familiar to madrigalists, 'The Triumphs of Oriana,' 1601. In Queen Elizabeth's 'Virginal Book' are five sets of lessons by Morley. But the work on which his fame is chiefly built is that alluded to above, 'A Plaine and Easie Introduction to Practical Musicke,' folio, 1597.

MORNINGTON, GARRETT WELLESLEY, EARL OF, was born in Meath about 1720, and advanced from the dignity of an Irish baron to that of an earl, in 1760. All that we know of the early history of this nobleman is from a paper printed among the 'Miscellanies' of the Hon. Daines Barrington, which says that as a child he displayed a great love for music; that he early learned to play on several instruments; that he was unrelaxing in his musical studies and labours, and so distinguished himself that the University of Dublin conferred on him the degree of Doctor in Music, and subsequently elected him professor of that faculty. He died in 1781.

Lord Mornington's compositions are chiefly vocal. He excelled most in the glee. His glee, 'Here in cool Grot,' gained the gold prize-medal given by the Catch Club in 1779. 'Gently hear me, charming Maid!' was published in Warren's 25th collection. 'Come, fairest Nymph,' likewise for four voices, has always been admired for its brilliancy and skill; and 'O, Bird of Eve,' for five voices, is one of the most elegant effusions that vocal harmony can boast.

MORO, ANTO'NIO, or SIR ANTONY MORE, was born at Utrecht, about the year 1525, and was the pupil of Jan Schoorel. He obtained, while still young, a great reputation at Rome, especially as a portrait painter. He was introduced to the Emperor Charles V., at Madrid, in 1552, painted his son Philip's portrait there, and at Lisbon painted the Infanta Mary, King John III., and Queen Catherine of Portugal.

In 1554 More was sent to paint Queen Mary of England; and he remained in England during the reign of Queen Mary, by whom he was probably knighted. He painted several portraits of her and many of the English nobility, some of which are at Hampton Court, and others are in the private collections of the descendants of the families. After the death of Mary, in 1558, More rejoined Philip in Spain, but quarrelled with that monarch, who banished him. He then entered the service of the Duke of Alva, and was appointed receiver-general of the revenues of West Flanders, an appointment, says Van Mander, which so elated him, that he made a bonfire of all his painting materials at Utrecht. He however continued to paint portraits of women, for the Duke, at Brussels.

More died at Antwerp, in 1581, aged fifty-six, while engaged on a picture of the Circumcision, which he left unfinished, for the church of Nôtre Dame there.

MOROCCO. [Marocco.]

MORO'NI, GIAMBATTISTA, was born about 1510, at Albino in Bergamo, and was the scholar of Moretto da Brescia, whom he surpassed as a portrait painter, and was inferior only to Titian. The heads and draperies of his portraits are beautiful. In his historical pieces he belongs rather to the Milanese school than the Venetian. The date of his death is not known, but his works range, according to Count Tassi, from 1557 to 1578.

MOROSI'NI, an illustrious family of Venice. Paul Morosini, born in 1406, wrote an 'Apology' for the Venetian government, and other works. Andrea Morosini, who died in 1618, wrote a continuation of Paruta's 'History of Venice,' down to the year 1615. But the most illustrious of the family is Francesco Morosini, who was born in 1618, and was general-in-chief for the defence of Candia against the Turks. He made a most gallant resistance, and concluded an honourable capitulation with the grand-vizier Coprogli in 1669.

In 1684, war having broken out again between Venice and the Porte, Morosini was appointed captain-general of the forces of the republic. He took the island of Santa Maura, landed in the Morea with 10,000 men, took Coron and Calamata, and defeated a Turkish army. In 1685 he took

Navarino and Modon, defeated the seraskier, and gained possession of Napoli. In 1687 he again defeated the seraskier near Patras, and subdued Patras, Lepanto, Corinth, and the whole of the Morea. Morosini then attacked the Acropolis of Athens, when a shell, thrown by the Venetians, fell on the Parthenon, and partly destroyed it. The Turkish garrison then surrendered.

In 1688 the doge Giustiniani died, and Morosini was elected in his place, retaining his command in the Levant. In 1689 he returned to Venice, but a few years afterwards he was again sent to the Morea, when illness terminated his career, at Nauplia, in 1693.

MORPETH. [NORTHUMBERLAND.]

MO'RPHIA, the first discovered of a numerous and important class of vegetable products, or alkalies, sometimes termed alkaloids. It was obtained in 1803 by Sertuerner, a German chemist, from opium, in which it exists in combination with a peculiar vegetable acid, the meconic acid, and probably also with sulphuric acid.

Morphia is precipitated in a flosculent state, which, on standing and stirring, assumes a crystalline appearance. It is colourless, and its taste is bitter. It is insoluble in cold water, and little soluble in hot water. It consists of O^6 C^{34} H^{18} N^1, and its crystals contain Morphia[1], Water[2].

When heated strongly, it emits a resinous smell, smokes, and burns with a lively red flame, and leaves charcoal.

Morphia is probably the most active principle of opium, but being so very slightly soluble in water, it is never used alone medicinally. Having however, like other alkalies, affinity for acids, it readily combines with them and forms salts, which are now extensively used in medicine.

The acetate and hydrochlorate of morphia are those salts which are usually employed medicinally. The acetate is in the form of colourless radiating needles, readily dissipated by exposure to heat. It consists of acetic acid[1], morphia[1]. Hydrochlorate of morphia is a colourless, inodorous, bitter salt, which crystallises in plumose acicular crystals: it consists of hydrochloric acid[1], morphia[1].

Morphia combines with other acids to form salts. The chief of these salts are the *meconate*, *sulphate*, *bisulphate*, *nitrate*, and *phosphate*.

MORPHOLOGY. [VEGETABLE MORPHOLOGY.]

MORRIS DANCE. The origin of this dance is uniformly given to the Moors. The fandango of Spain, danced to the present day, is the old Moorish or Morris dance. It is supposed to have been first brought to England in the time of Edward III., when John of Gaunt returned from Spain. The hobby-horse, which once performed the principal character in the dance, was a light frame of wicker-work, furnished with a pasteboard head and neck of a horse. This was buckled round a man's waist, and covered with a foot-cloth which reached to the ground, and concealed his legs. Thus equipped he exhibited specimens of burlesque horsemanship. Besides the hobby-horse, the dancers were, a fool, May or maid Marian, a friar, a serving-man, a piper, and two Moriscos.

MORRISON, ROBERT, the first Protestant missionary to China, was born at Morpeth, Northumberland, Jan. 5, 1782. In 1799 he commenced a course of religious reading and study. In 1801 he began to study Hebrew, Latin, and theology. In May, 1804, he offered his services as a missionary to the London Missionary Society, and removed from Hoxton to the Mission College at Gosport. In August, 1805, he commenced the study of Chinese under a native teacher. In January, 1807, he was ordained as a missionary, and in September of the same year he arrived at Canton. In 1808 Mr. Morrison was appointed translator to the East India Company's factory at Canton. In 1810 the Acts of the Apostles in Chinese, which he had brought with him, were printed. In 1815 a Chinese grammar, which he had prepared, was printed at Serampore, at the expense of the East India Company. In 1812 the Gospel of St. Luke in Chinese was printed, and by the beginning of 1814, the whole of the New Testament being ready for the press, the East India Company sent out a press and materials, and a printer to superintend the printing of the work.

In 1813 the London Missionary Society sent out the Rev. Dr. Milne to assist Mr. Morrison. In 1815 the Book of Genesis and the Psalms were printed. In the following year the Chinese dictionary was finished, and before the end of 1821 was printed by the East India Company at a cost of 15,000*l*. In 1817 the university of Glasgow conferred on Mr. Morrison the degree of D.D. The translation of the bible was completed in 1818. Of the New Testament Dr. Morrison had translated the four gospels, and from Hebrews to the end. In 1824 he returned to England, and remained till 1826, when he again sailed for China. His time was now occupied in preaching, translating, superintending the distribution of printed works, and promoting education. In the midst of these occupations Dr. Morrison died, Aug. 1, 1834, at Canton.

MORRHUA, a genus of fishes of the order *Malacopterygii* and section *Subbrachiales*. In this genus the ventral fins are pointed, and situated under or rather in advance of the pectorals; there are three dorsal and two anal fins. The body is elongated and smooth, compressed towards the tail. The chin is furnished with a single barbule. The following are British species:—1, The Common Cod (*Morrhua vulgaris*); 2, The Dorse (*M. Callarias*); 3, The Haddock (*M. æglefinus*); 4, The Bib or Pout (*M. lusca* and *barbata*); 5, The Poor or Power Cod (*M. minuta*); and 6, The Speckled Cod (*M. punctata*).

The cod-fish is an inhabitant of the northern seas, and is common on various parts of our coast. In the United Kingdom alone, this fish, in the catching, curing, partial consumption, and sale, supplies employment, food, and profit, to thousands of persons. The fish spawns in February, and is in perfection from October to Christmas. For an account of the mode of conducting the fishery see Yarrel's 'British Fishes.'

MORSE, one of the names of the *Walrus*. [SEALS.]

MORTAGNE. [ORNE.]

MORTAIN. [MANCHE.]

MORTALITY, LAW OF. Uncertain as is the life of any one individual, it is now very well known that if two different numbers of individuals, at or near the same age, be taken, the number that will be left at the end of a few years will be nearly the same, if they exist during that time under similar circumstances.

The law of mortality, theoretically speaking, is a mathematical relation between the numbers living at different ages; so that, having given a large number of persons alive at one age, it can be deduced by the law what number shall survive any given number of years: practically speaking, it is, in the absence of such a mathematical law, the exhibition in a table of the numbers surviving at the end of each year.

The obvious and simple mode of forming a table of mortality would be to take a large number of infants born alive, all of the same sex and in the same station of life. If the numbers left alive at the end of every year were noted, until all had become extinct, a column of ages, accompanied by an opposite column noting the number of survivors, would be a table of mortality in the most usual form.

The formation of such a table might require a century of observation. To avoid this, the law of mortality must be assumed stationary; that is, it must be presumed that, out of those who reach, say age 70, the proportion who die in a year is now what it will be when an infant new-born reaches that age. This being assumed, let the members of a community be counted, and their ages registered; at the end of a year it will appear what proportion of each age has died. If the process be repeated in succeeding years, other sets of events are obtained, which may all be put together into one table, when the number has become large enough to secure the observed events representing the average, and to destroy the effects of accidental fluctuations.

If the population, say of a town, remained unaffected, or sensibly unaffected, by immigration or emigration, that is, if all who were born in the place, and no others, were registered in the burials of the place, the burial registers would form a mortality table, provided the rate of increase of the population were steady and known.

If we were to look to the wants of the subject, whether as a physical investigation or a statistical one, we should find that it is everywhere in the merest infancy. The fact of a difference of mortality between the two sexes is established, and it also seems to be known that where the occupations of females are not above their strength, their mortality is less than that of males; but no settled determination of the amount of difference has been obtained. As to whether married or single life is the longest, whether the age of the parents, or the relative age, affects the mortality of the children, whether the earlier children of a marriage differ in their law of mortality from the later, &c., we have no information at all.

The following is the *Carlisle Table*, which is that of most authority and most used in office calculations:—

I. *Decrements of Human Life, according to the Carlisle Table.*

Age.	Carlisle.	Decrements.	Age.	Carlisle.	Decrements.
0	10000	1539	56	4000	76
1	8461	682	57	3924	82
2	7779	505	58	3842	93
3	7274	276	59	3749	106
4	6998	201	60	3643	122
5	6797	121			
6	6676	82	61	3521	126
7	6594	58	62	3395	127
8	6536	43	63	3268	125
9	6493	33	64	3143	125
10	6460	29	65	3018	124
11	6431	31	66	2894	123
12	6400	32	67	2771	123
13	6368	33	68	2648	123
14	6335	35	69	2525	124
15	6300	39	70	2401	124
16	6261	42	71	2277	134
17	6219	43	72	2143	146
18	6176	43	73	1997	156
19	6133	43	74	1841	166
20	6090	43	75	1675	160
21	6047	42	76	1515	156
22	6005	42	77	1359	146
23	5963	42	78	1213	132
24	5921	42	79	1081	128
25	5879	43	80	953	116
26	5836	43	81	837	112
27	5793	45	82	725	102
28	5748	50	83	623	94
29	5698	56	84	529	84
30	5642	57	85	445	78
31	5585	57	86	367	71
32	5528	56	87	296	64
33	5472	55	88	232	51
34	5417	55	89	181	39
35	5362	55	90	142	37
36	5307	56	91	105	30
37	5251	57	92	75	21
38	5194	58	93	54	14
39	5136	61	94	40	10
40	5075	66	95	30	7
41	5009	69	96	23	5
42	4940	71	97	18	4
43	4869	71	98	14	3
44	4798	71	99	11	2
45	4727	70	100	9	2
46	4657	69	101	7	2
47	4588	67	102	5	2
48	4521	63	103	3	2
49	4458	61	104	1	1
50	4397	59			
51	4338	62			
52	4276	65			
53	4211	68			
54	4143	70			
55	4073	73			

The explanation is as follows:—Of 10,000 infants born at Carlisle, 1539 would die in their first year, and 8461 would survive, while 4000 would live to 56 and upwards.

Of the three species of tables, this is the most useful for mathematical deduction, and the least adapted for a comparative view.

II. *Yearly Rates of Mortality upon* 10,000 *Lives according to the Carlisle Table.*

Age.	Carlisle.	Age.	Carlisle.	Age.	Carlisle.
0	1539	36	106	71	588
1	789	37	109	72	681
2	649	38	112	73	781
3	379	39	119	74	902
4	287	40	130	75	955
5	178				
6	123	41	138	76	1030
7	88	42	144	77	1074
8	66	43	146	78	1088
9	51	44	148	79	1184
10	45	45	148	80	1217
11	48	46	148	81	1338
12	50	47	146	82	1407
13	52	48	139	83	1509
14	55	49	137	84	1588
15	62	50	134	85	1753
16	67	51	143	86	1935
17	69	52	152	87	2162
18	70	53	161	88	2198
19	70	54	169	89	2155
20	71	55	179	90	2606
21	69	56	190	91	2858
22	70	57	209	92	2800
23	70	58	242	93	2593
24	71	59	283	94	2500
25	73	60	335	95	2333
26	74	61	358	96	2174
27	78	62	374	97	2222
28	87	63	382	98	2143
29	98	64	398	99	1818
30	101	65	411	100	2222
31	102	66	425	101	2857
32	101	67	444	103	4000
33	101	68	465	103	6667
34	102	69	491	104	10000
35	103	70	516		

Thus of 10,000 persons attaining the age of 40, 130 die in the following year, according to the Carlisle Table; while of 10,000 who attain the age of 41, 138 die in the next year. This table is applicable to the comparison of two sets of data at and near a given age; while the next serves to compare the total character of two sets of data from and after a given age.

III. *Mean Duration of the Lives of* 100 *individuals of every age, according to the Carlisle Table.*

Age.	Carlisle.	Age.	Carlisle.	Age.	Carlisle.
0	3872	36	3032	71	865
1	4468	37	2964	72	816
2	4755	38	2896	73	772
3	4982	39	2828	74	733
4	5076	40	2761	75	701
5	5125				
6	5117	41	2697	76	669
7	5080	42	2634	77	640
8	5024	43	2571	78	612
9	4957	44	2509	79	580
10	4882	45	2446	80	551
11	4804	46	2382	81	521
12	4727	47	2317	82	493
13	4651	48	2250	83	465
14	4575	49	2181	84	439
15	4500	50	2111	85	412
16	4427	51	2039	86	390
17	4357	52	1968	87	371
18	4287	53	1897	88	359
19	4217	54	1828	89	347
20	4146	55	1758	90	328
21	4075	56	1689	91	326
22	4004	57	1621	92	337
23	3931	58	1555	93	348
24	3859	59	1492	94	353
25	3786	60	1434	95	353
26	3714	61	1382	96	346
27	3641	62	1331	97	328
28	3569	63	1281	98	307
29	3500	64	1230	99	277
30	3434	65	1179	100	228
31	3368	66	1127	101	179
32	3303	67	1075	102	130
33	3236	68	1023	103	83
34	3168	69	970	104	50
35	3100	70	918		

To avoid decimal points, 100 persons are supposed at each age: thus, 100 persons aged 30 enjoy among them 3434 years, according to the Carlisle table, or each of them on the average 34.34 years. This sort of table is much the best for a running comparison of two laws of mortality.

MORTAR. Common mortar is the substance placed between the stones or bricks of a building to cement them together. Mortar is essentially composed of slacked lime and siliceous sand. The hardness which mortar acquires is owing to the gradual conversion of the lime into carbonate of lime, which takes place very slowly by the absorption of carbonic acid gas from the atmosphere. In this state it adheres very firmly to the particles of silica diffused through it, and both are strongly

united with the material employed in the building.

When limestones contain considerable portions of silica and alumina, they form what has been termed *Hydraulic Lime*, and the mortars made with them are called *Hydraulic Mortars*. Of these, Parker's cement is a well known kind: it will *set*, as it is termed, or become solid, in a quarter of an hour, either in the air or under water. In France artificial hydraulic lime has been prepared, and appears to answer the purpose extremely well.

MORTAR, a vessel in which substances are either reduced to fragments, pulverised, or dissolved, by beating or trituration with a pestle. Mortars are made of cast-iron, stone-ware, glass, agate, flint, or porphyry, according to the use to which they are to be applied.

MORTARA. [Novara.]

MORTARS are pieces of ordnance which, compared with guns, are very short, and which are employed to throw shells or carcasses at considerable elevations (generally at 45°, in order that the missile may range to a great distance, and, by falling nearly vertically upon the object (a barrack, magazine, or casemate), may crush it by the momentum acquired in descending. Mortars are either of iron or brass; they rest upon solid beds, and the trunnions or cylinders upon which they turn, in giving the required elevation, are placed at the lower extremity of the piece. The calibres of mortars in the British service are $4\frac{2}{5}$, $5\frac{1}{2}$, 8, 10, and 13 inches. All these different kinds of mortars are used on land, and the two last are also employed in the navy; but in this latter service the pieces are about 16 inches longer than the land-service pieces of the same calibre. The first two are sometimes called royal mortars.

It has been supposed that mortars were employed in the year 1495, at the siege of the castle of Naples, but this is doubtful: in 1588 however the use of mortars must have been well known; since, in the Appendix to the 'Colloquies' of Tartaglia, published in that year, the method of filling the projecting carcasses is fully described.

The Dutch engineer Coehorn invented small mortars for throwing granades into the covered-ways of places. They were capable of being carried about and served by one man; consequently they could be readily brought up to a convenient spot, and rapidly fired when it was intended to drive the defenders from behind the parapets. In the French service *Pierriers* (small mortars loaded with stones) are still employed for the same purpose. Stones have been occasionally fired from excavations in rocks; and there are several rock-mortars, as they are called, at Malta.

MORTGAGE. A general notion of a mortgage may be collected from the following passage in Littleton (s. 332), who treats of mortgages, as then in use, under the general head of estates upon condition.

'If a feoffment be made upon such condition, that if the feoffor pay to the feoffee, at a certain day, 40*l*. of money, that then the feoffor may reenter, &c.,—in this case the feoffee is called tenant in mortgage, which is as much to say, in French, as *mortgage;* and in Latin, *mortuum vadium*. And it seemeth that the cause why it is called mortgage is, for that it is doubtful whether the feoffor will pay, at the day limited, such sum or not: and if he doth not pay, then the land, which is put in pledge upon condition for the payment of the money, is taken from him for ever, and so dead to him, upon condition, &c. And if he doth pay the money, then the pledge is dead as to the tenant,' &c.

A mortgage is a contract, and therefore requires two persons at least, one of whom borrows and the other lends money. The borrower is the owner of land, or has some interest in land, which he conveys or transfers as a security to the lender of the money; the borrower is called the mortgagor, and the lender is called the mortgagee. The whole transaction is properly termed a mortgage; but the name is sometimes applied simply to the debt.

The relationship of the mortgagor and the mortgagee, and their several rights and obligations, which result from this contract, belong to the general doctrine of pawn or pledge; but the nature of property in land in England has modified the general rules as to pledge, which are received in all countries where the Roman law has had any influence.

MORTIFICATION (in Medicine) is the death of any tissue. It may occur from a variety of causes, as intense inflammation, or from anything which is followed by a cessation of the circulation of blood through a part, as diseases of the arteries and veins, the pressure of tumours and foreign bodies, excessive debility, &c., or from any sudden and violent chemical or mechanical agent, as strong acids or other corrosive substances, excessive heat or cold, violent blows, &c. The process of reparation consists in the separation of the living tissues from the dead, the removal of the dead tissues by absorption or by being thrown off externally, and the granulation and cicatrization of the exposed surface of the living tissues.

MORTIMER, JOHN HAMILTON, was born in 1741, and was the son of a miller. John having discovered a taste for drawing, he was, at about the age of eighteen or nineteen, placed under Hudson, who had been the instructor of Reynolds. One of his earliest works, founded on an incident in the life of Edward the Confessor, obtained from the Society for the Encouragement of Arts a premium of fifty guineas, and that of St. Paul preaching to the Britons one hundred guineas. He was further distinguished by the notice and friendship of Reynolds. His groups of banditti are masterly; and his 'King John signing Magna Charta,' 'The Battle of Agincourt,' &c., show him to have possessed great and original powers in the higher walk of art; and in his knowledge of the human figure he has rarely been surpassed. The 'Brazen Serpent in the Wilderness,' in the great window of Salisbury cathedral, and the cartoons for that in Brazenose College, Oxford, were designed by him. He died on February 4, 1779.

MORTMAIN. By the 9 H. III. c. 36 (Magna Charta), it was declared that it should not be

lawful for the future for any person to give his land to a religious house so as to take it back again and hold it of the house; and any such gift to a religious house was declared to be void, and the land was forfeited to the lord of the fee. The reason of this provision is obvious, if we consider the nature of the feudal tenure; and indeed it is distinctly expressed in the preamble of the statute of the 7 Edward I., sometimes entitled 'De Religiosis,' as follows: 'Whereas of late it was provided that religious men should not enter into the fees of any without the license and consent of the chief lords (capitalium dominorum) of whom such fees are immediately held; and whereas religious men have entered as well into fees of their own as those of others, by appropriating them to their own use and buying them, and sometimes receiving them of the gifts of others, by which means the services due from such fees, and which were originally provided for the defence of the realm, are unduly withdrawn, and the chief lords lose their escheats of the same,' &c. The statute then forbids any religious person or any other to buy or sell lands or tenements, or under colour of a gift or term of years, or any other title whatever, presume to receive from any one, or by any other means, art, or contrivance, to appropriate to himself lands or tenements, so that such lands and tenements come into mortmain in any way (ad manum mortuam deveniant), under pain and forfeiture of the same. The statute then provides, that if it is violated, the lord of whom the lands are holden may enter within a year; or, if he neglect to enter, the next lord may enter within half a year; and if all the chief lords of such fees, being of full age, within the four seas and out of prison, neglect to enter, the king may enter.

The general notion of mortmain may be collected from the words of this statute, the term being used to express lands belonging to any corporate body, ecclesiastical, or sole, or aggregate. Various explanations have been offered as to the reason why lands of this description were said to be in mortmain, or in mortua manu, that is, in a dead hand. Under the feudal system, lands held by any corporate body or person might not inappropriately be said to be in a dead hand as to the lord of the fee; for as a corporation has a perpetual existence, the lord lost the profits of his lands, which, under the strict system of tenures, he derived either from the services of the tenant, while alive, or from the death of the tenant, and other circumstances. Accordingly, the best explanation of the meaning of this term seems to be that offered by Coke, that 'the lands were said to come to dead hands as to the lords, for that by alienation in mortmain they lost wholly their escheats, and in effect their knights' services for the defence of the realm, wards, marriages, reliefs, and the like, and therefore was called a dead hand, for that a dead hand yieldeth no service.'

Before the 9th Henry III. c. 36 was passed, a man might give or sell his lands to religious as well as any other persons, unless it was forbidden in the gift of the lands to himself; and, accordingly, the great lords, on making a grant of land, used to insert a clause preventing the sale or gift to religious persons, and also to Jews. Numerous statutes were subsequently enacted to prevent the alienation of land in mortmain, as the 15 Richard II. c. 5.

The statute of the 9 Geo. II. c. 36, is now commonly, though not correctly, called the Statute of Mortmain. It applies only to England and Wales. It is entitled 'An Act to restrain the Disposition of Lands, whereby the same become inalienable.' The object of this act, as explained by Lord Hardwicke, was the following:—

'The mischief which the legislature had in view in the Mortmain Act (as appears from the recital, and which is agreeable to the title) was to restrain the disposition of lands whereby they become inalienable.' In another place he observes that 'the particular views of the legislature were two: first, to prevent locking up land and real property from being aliened, which is made the title of the act; the second, to prevent persons, in their last moments, from being imposed on to give away their real estates from their families.'

The provisions of the act very imperfectly correspond with this explanation of its object. The act, which is a clumsy contrivance, and the exposition of it, are in fact directed against gifts for charitable uses; though it is probable that the notion of the impolicy of allowing lands to be for ever set apart, or 'locked up,' had also some influence on the legislature. If this, however, had been the leading idea, a repeal of the statute which allows the crown to grant a licence to hold lands in mortmain would have been a proper addition to the act.

Various acts have been passed since the 9 Geo. II. c. 36, as already stated, for exempting various bodies from the operation of that act. These acts chiefly apply to the Established Church. The 58 Geo. III. c. 45, amended by 59 Geo. III c. 134; and 2 & 3 Wm. IV. c. 61, are intended to promote the building of new churches in populous places in England and Wales. The 43 Geo. III. c. 107, was passed to exempt decrees and bequests to the governors of Queen Anne's Bounty. [Benefice.]

The term *Mortification* in Scotland expresses pretty nearly what Mortmain does in England.

MORTON, JOHN, was born at Bere in Dorsetshire, in 1410. He studied at Balliol College, Oxford, and practised as an advocate in the Court of Arches, where he acquired the notice of Cardinal Bourchier. The cardinal introduced him to King Henry VI., who made him one of his privy-council. He adhered to this unfortunate prince with so much fidelity, that even his successor Edward IV. rewarded his fidelity. In 1478 he made him Bishop of Ely and lord chancellor of England, and at his death appointed him one of his executors. He is said to have been the person who first proposed the coalition of the two houses of York and Lancaster by the marriage of Henry of Richmond with the eldest daughter of Edward IV. As soon as Henry VII. was seated on the throne, he made Morton one of his privy-council, and in 1486 promoted

him to the archbishopric of Canterbury. In August, 1487, he was again constituted lord chancellor, and in 1493 created a cardinal by Pope Alexander VI. He died September 15, 1500.

MORTON, JAMES DOUGLAS, Fourth EARL OF, and Regent of Scotland, was a younger son of the great family of Angus. Morton was the second son of Sir George Douglas of Pittendreich. He married Lady Elizabeth Douglas, daughter of the third Earl of Morton by a natural daughter of King James V.; and on that occasion the Earl, having no male issue, obtained a new reversionary clause to his patent, transferring the earldom to his son-in-law. In consequence of this provision he was styled the Master of Morton; and in 1553 he became Earl of Morton. Up to this time he, like his father, was a promoter of the Reformation, and a friend of King Henry VIII. On January 7, 1563, he was constituted lord high chancellor of Scotland. He was obliged to lay down this office and fly into England, on the occasion of Rizzio's murder, in which affair he took a prominent part. He remained in England till the end of the year, when he was restored to Mary's favour by the intercession of Bothwell, who soon opened to him the plot for the murder of Darnley, in which Morton refused to concur. But he neither informed Darnley of the plot, nor took measures to prevent its being executed; and he subscribed the bond, to protect Bothwell against the charge of being concerned in the murder, and to promote his marriage with the queen. Yet when this event took place Morton was the great leader in opposition to him. When Mary was imprisoned, the Earl of Murray was made regent, and Morton reinstated in the office of lord chancellor. He continued in this situation during the regencies of Murray, Lennox, and Mar; and on Mar's death Morton was himself appointed regent of the kingdom. Finding himself becoming odious to the nation, he conceived the idea of retrieving his reputation by offering to resign the government to the king (James VI.), then in his twelfth year. On September 12, 1577, he resigned his office to King James VI., by the advice of Athol and Argyl, who accepted it, to the great joy of the people. Morton retired to Lochleven, until an opportunity presented itself to become master both of Stirling Castle and of the king's person. He then by the help of Queen Elizabeth retained power for some time, until the king's favourite, Captain Stewart, charged him with being accessory to the murder of Darnley. Upon this charge Morton was arrested. Elizabeth used every endeavour in favour of Morton; but he was, on June 1, 1581, brought to trial in Edinburgh, found guilty, and condemned. When that part of the verdict was read which found that he was accessory to the murder, he exclaimed, 'God knows it is not so.' He was beheaded on June 3, 1581.

MORTON, THOMAS, was born in 1764, in the county of Durham. He was entered a student of Lincoln's Inn, but having written a dramatic piece which was favourably received, he abandoned the legal profession without having been called to the bar. His success as a dramatic writer was very great at the time, and he received large sums for his productions. Their merit however was not of a high order. Out of 14 or 15 comedies, comic-operas, and farces, few retain possession of the stage. The two now best known, are 'Cure for the Heart Ache,' and 'Speed the Plough.' Morton died March 28, 1838.

MORVEAU. [Guyton de Morveau.]

MORUS ALBA, or the White Mulberry, is a native of China, where it forms a small tree, and whence it has been gradually carried westward, till it has become a common plant in most of the temperate parts of the Old World, forming in the south of Europe a pollard-tree by road sides. It is on this species that the silkworm is chiefly fed; and in silk countries many varieties are cultivated for the purpose, some of which are said to be much better than others. Some years since a mulberry was introduced into France from Manilla, whence it has gained the name of the Philippine Mulberry, the great excellence of which seems universally acknowledged. It grows much faster than the white mulberry, and strikes from cuttings as freely as a willow, which is not the case with the white mulberry. The abundance of its leaves is much greater than any other known variety, and it is not only freely eaten by the silkworms but perfectly agrees with them. Its culture is now superseding that of all others in the south of Europe, and it is even taken as a stock on which to graft the common white mulberry, when the latter is wished for.

MORUS NIGRA. [Mulberry.]

MORVAN, LE, a small hilly and well-wooded district in France, which is now included in the departments of Nièvre and Yonne.

MORYSON, or MORISON, FYNES, was a native of Lincolnshire, and born in 1566. He wrote an 'Itinerary, containing twelve years' travels through Germany, Böhmerland, Switzerland, Netherland, Denmark, Poland, Italy, Turkey, France, England, Scotland, and Ireland;' and a 'History of Ireland, from the year 1599 to 1603.' He died about 1614.

MOSAIC (*Opus Musivum*), a species of inlaid or tessellated work, made with minute pieces of coloured substances, generally either marble or other coloured stones, or else glass more or less opaque, and of every variety of hue which the subject may require. The former mode was that chiefly employed by the Romans for their costly tessellated pavements, many of which have at various times been discovered in England.

Mosaics of this description, that is, for pavements, generally consist only of a series of ornamental borders inclosing one or more compartments containing some figure or device, or occasionally a group or subject. Others consist entirely of a pattern, generally in two colours, sometimes in three—black, white, and red. Examples of pavement mosaics in each of these modes have been discovered at Pompeii. Mosaic continued to be used both for pavements and ornamenting walls to a late period in the middle ages, and was greatly practised in Byzantine buildings, and by Byzantine artists who were also employed in Italy.

Something akin to mosaic or coloured inlaid-work was occasionally employed in Italy during the middle ages for external decoration also; as an instance of which the façade of the Duomo at Pisa may be mentioned, where, though the pattern is chiefly in black and white, brilliant reds and blues are intermixed at intervals.

Although nearly similar as to their process, mosaic pictures, especially some of those of later times, may be considered as a distinct branch of the art. Whether actually employed as pavements or inserted in walls, mosaics of this class consist chiefly of ornament and pattern, executed in few and simple colours, with hardly any attempt at variety of tints and due graduation of tones, even in the figures, human or animal, occasionally introduced in them. For a long period after the decline of the arts, mosaic painting continued to be employed in Italy, both externally and internally, for the decoration of churches, as for instance, on the façade as well as within the basilica of St. Mark at Venice. Some have supposed that such productions were entirely the work of Byzantine or Greek artists, but the contrary opinion is maintained by Cicognara, who asserts that mosaic was practised by native Italians, and that it was well known to the earliest Venetians.

Copies of celebrated works by Raphael and other masters have been executed in mosaic, and have the effect of paintings produced in the usual way, though they are attended with infinitely greater cost, and are beyond all comparison more laborious and tedious in their process. As each separate piece of glass is of the same colour throughout, the graduation of tints, the melting off of any one colour from its highest light to its darkest shadow, can be obtained only by an immense number of small pieces, of which those contiguous to each other exhibit scarcely any perceptible difference to the eye. The sole advantage, in any degree proportionate to the cost attending it, is the extreme durability of the work when once accomplished.

Similar mosaic is employed sometimes on a miniature scale, for pictures on the lids of snuff-boxes and articles of that kind, or tablets in chimney-pieces, which are at the best mere curiosities and very laborious trifles. *Florentine Work* may also be mentioned as a species of mosaic, chiefly used for inlaying or veneering marble slabs for tables, and decorative purposes of that sort, upon a moderate scale.

MOSAMBIQUE. [Mozambique.]

MOSASAURUS, Mr. Conybeare's name for a gigantic extinct aquatic Saurian, *Saurochampsa* of Wagler, considered by Faujas St. Fond to be a crocodile, but whose true position among the Saurians was pointed out by Camper and confirmed by Cuvier. Indeed, previous to their investigations, the nearly perfect head of this Saurian, known as the great animal of Maastricht, and found near that city in the calcareous freestone forming the most recent deposit of the cretaceous formation, was a stumbling-block to naturalists, some of whom were of opinion that it was a whale. The zoologists last named, and especially Cuvier, have satisfactorily proved that it was a great marine reptile, and very nearly allied to the Monitor. [Monitor.] The teeth are without true roots, not hollow as in the crocodile, but solid throughout, and joined to the sockets by a broad bony basis, the result of the hardening of the pulp from which the teeth were formed, and likewise attached to the jaw by the ossification of the pulp that had furnished the enamel. 'This indurated capsule,' writes Dr. Buckland, in his 'Bridgewater Treatise,' 'passed like a circular buttress around its base, tending to make the tooth an instrument of prodigious strength. The young tooth first appeared in a separate cell in the bone of the jaw and moved irregularly across its substance, until it pressed against the base of the old tooth; causing it gradually to become detached, together with its base, by a kind of necrosis, and to fall off like the horns of a deer. The teeth in the roof of the mouth are also constructed on the same principle with those in the jaw, and renewed in like manner.'

This gigantic animal measured about 25 feet in length. The head of *Mosasaurus Camperi* in the Paris Museum is 4 feet long.

'The tail was flattened on each side, but high and deep in the vertical direction, like the tail of a crocodile; forming a straight oar of immense strength to propel the body by horizontal movements analogous to those of skulling. Although the number of caudal vertebræ was nearly the same as in the Monitor, the proportionate length of the tail was much diminished by the comparative shortness of the body of each vertebra; the effect of this variation being to give strength to a shorter tail as an organ for swimming; and a rapidity of movement, which would have been unattainable by the long and slender tail of the Monitor, which assists that animal in climbing. There is a further provision to give strength to the tail, by the chevron bones being soldered firmly to the body of each vertebra, as in fishes.

'The total number of vertebræ was one hundred and thirty-three, nearly the same as in the Monitors, and more than double the number of those in the Crocodiles. The ribs had a single head, and were round, as in the family of Lizards. Of the extremities, sufficient fragments have been found to prove that the Mosasaurus, instead of legs, had four large paddles, resembling those of the Plesiosaurus and the Whale: one great use of these was probably to assist in raising the animal to the surface in order to breathe, as it apparently had not the horizontal tail by means of which the Cetacea ascend for this purpose. All these characters unite to show that the Mosasaurus was adapted to live entirely in the water; and that, although it was of such vast proportions compared with the living genera of these families, it formed a link intermediate between the Monitors and the Iguanas.' (Buckland's 'Bridgewater Treatise.')

Localities.—Maastricht, upper chalk in England (near Lewes in Sussex), green-sand of Virginia, Sandy Hook and Woodbury, New Jersey.

MOSCHEROSCH, JOHANN MICHAEL,

known under the pseudonym of Philander von Sittewald, was born March 5, 1600, at Willstadt, a small town in Hanau-Lichtenberg, where his father was preacher. In 1656 he was made president of the consistory at Hanau; and died April 4, 1669, at Worms.

As a writer he obtained much popularity in his time by his 'Wünderliche und wahrhafte Gesichte Philanders von Sittewald,' a collection of satirical pieces in the form of visions.

MO'SCHIDÆ, a family of ruminant quadrupeds known familiarly as Musk Deer, from the circumstance that the male of one of the species (*Moschus moschiferus*) produces that well known substance called musk, the secretion of a glandular abdominal pouch, for the sake of which the animal is hunted in the regions which it frequents, viz. the high mountain ranges of China, Thibet, Tonquin, Pegu, and Southern Tartary. [MUSK.]

Musk Deer (*Moschus mosc*

The Moschidæ resemble the deer in general form, but are all of small size, the largest only equalling a roebuck in stature, while others are less than a common hare. They are all very beautiful, with large dark beaming eyes, a small head, and taper muzzle. The limbs are delicate and slender. There are neither horns nor suborbital sinuses; the muzzle is naked. There are long canines in the upper jaw of the males, projecting downwards, and coming out between the lips; the canines are compressed and arched backwards, pointed, and sharp-edged posteriorly. Besides the two toes united to a single canon bone as usual, there are two accessory toes on each foot, each of which has its own slender metatarsal or metacarpal bone. Teats on the female, four.

Mr. Gray divides the Moschidæ into three genera, viz. *Moschus*, *Meminna*, and *Tragulus*; most authors however adopt the Linnæan genus *Moschus*, as including all the species.

Setting aside the true Musk-Deer (*M. moschiferus*), the other members of the genus are termed Chevrotins, and till recently were supposed to be respectively restricted to Java, Sumatra, Ceylon, and other islands adjacent. Mr. Hodgson however describes a species (*M. leucogaster*) as a native of Nepaul; and to the surprise of naturalists a species has been discovered in Sierra Leone, to which, from its aquatic habits, Mr. Ogilby has given the title of *Moschus aquaticus*. (See 'Proceeds. Zool. Soc.,' 1840, p. 35.)

Examples.—The Musk (*M. moschiferus*). The Meminna (*Mochus Meminna*). Locality, Ceylon, Java, and the dense woods of the western Ghauts of Hindustan. The Napu (*M. Javicus*, Pallas; *M. Napu*, F. Cuvier). Size of a hare. Locality, Java and Sumatra. The Kanchil (*M. Kanchil*, Raffles). Locality, Java. (See 'Proceeds. Zool. Soc.,' 1836, p. 63, for some observations on the genus *Moschus*, by Mr. Gray, with descriptions of two new species: see also 'Pictorial Museum of Animated Nature.')

Fossil Moschidæ.—The following species are recorded:—*M. antiquus*, Kaup (Epplesheim Sand). *M. Bengalensis* (Tertiary, north-east border of Bengal, Pentland). *M. Prattii* (Tertiary, Isle of Wight, Pratt). Dr. Schinz also mentions the teeth of these ruminating animals as occurring in the tertiary coal of Zürich.

MOSCHUS, a native of Syracuse, and a pastoral poet, probably lived in the third century B.C., and was the friend, and, some say, the disciple, of Bion of Smyrna, whose death he deplores in pathetic strains in his 'Epitaph of Bion.' There remain of his compositions four Idylls and a few other small pieces. The Idylls are characterised by great elegance and delicacy, but are perhaps somewhat too highly polished, and overloaded with ornament. Bion and Moschus have been inserted in most editions of Theocritus, and are also in the collections of Brunck, Gaisford, and Boissonade. Moschus has been translated into German by J. H. Voss and others.

MOSCOW (in Russian, MOSKWA), one of the eight governments of Great Russia, is situated nearly in the centre of European Russia, between 54° 40′ and 56° 30′ N. lat., and 35° 10′ and 38° 40′ E. long. It is bounded on the north-west by Twer, on the north-east by Wladimir, on the south-east by Riäsan, on the south by Tula, on the south-west by Kaluga, and on the west by Smolensk. The area is about 11,000 square miles. The population is 1,375,000. It is divided into thirteen circles.

The face of the country is an undulating plain, here and there broken by groups of low hills and the steep banks of the rivers. The soil is for the most part loam and sand, with some heath and marsh; and on the whole the land is but moderately fertile. Boulders of various kinds of rock are everywhere met with. There are said to be no less than 109 small lakes and 2610 rivers and streams. The principal rivers are the Wolga, the Oka, and the Moskwa. The rivers are in general frozen about the middle of November, and thaw by the end of March.

Agriculture is the chief occupation of the inhabitants, and Moscow is one of the best cultivated as well as one of the most populous provinces of the whole empire. Flax, hemp, and hops are cultivated. Horticulture is carried on to a great extent, and the produce is nearly adequate to the consumption. Timber and wood-fuel are plentiful. Horses, cattle, calves, and poultry are reared. Bears and wolves prowl about the great forests.

The minerals are freestone, potters' clay, brick-clay, lime, gypsum, alabaster, and bog-iron.

Manufactures of various kinds are carried on to a great extent, both by the country-people for their own supply as well as for sale, and also in the villages and towns, and especially in the capital. The province has an extensive inland trade.

Besides Moscow, the chief towns are *Kolomna*, which contains 17 churches, many large manufactories, an extensive local commerce, and about 11,000 inhabitants; *Serpuchow*, a busy town of 6000 inhabitants; and *Wereja*, a town of about the same size.

The inhabitants are all of Russian origin. The Russians are of the Greek religion, of which there are in this province above 1300 churches, under the Archbishop of Moscow. The Roman Catholics, Lutherans, and Calvinists have churches in Moscow.

MOSCOW (in Russian *Moskwa*, pronounced *Moskva*), the ancient and original capital of the Russian empire, was founded in 1147, by the Grand Duke Yury II., surnamed Dolgorucky, or Long-Hand.

Moscow is situated in 55° 45′ 45″ N. lat., and 37° 33′ E. long., in a fertile and richly cultivated country on the banks of the river Moskwa, and of the rivulets Yausa and Neglina. The form of the city is a sort of irregular rhomboid, and its circumference is generally stated at about 26 English miles. In this space however there are above 1000 gardens, besides about 240 kitchen-gardens, some of them of great extent, and a number of fields or parks called Poles, which are uninclosed fields used for promenades, for holding festivals, and for exercising troops; there are likewise 253 ponds or small lakes, on the banks of some of which there are public walks and fine gardens laid out with much taste.

Moscow is divided into—1. The central part, containing the Kremlin. 2. The Kitai-Gorod or Chinese Town. 3. The Beloi-Gorod, or White Town, surrounding the central part. 4. The Zemlianoi-Gorod, or Earthen Town, so called from the earthen ramparts with which it is surrounded. 5. The Slobodi, or suburbs.

As seen from a distance, Moscow is very beautiful. It has 600 towers belonging to its churches; and these towers being gaily painted present a lively scene. They are mostly situated in open squares, so as to have escaped the devastating fire of 1812. The roofs of the houses are made of iron plates, painted dark green. Many of the cupolas of the towers are gilt. The city contains 7 cathedrals, 21 monasteries, about 250 Greek churches, and a few places of worship for Roman Catholics, Protestants, Armenians, and Turks.

I. The *Kremlin*, which was first built of stone in 1367, in a commanding situation on the banks of the Moskwa, is a singular, beautiful, and magnificent object. It is surrounded with walls from 12 to 16 feet thick, and from 28 to 50 feet high, having battlements, embrasures, numerous towers, and 5 gates. The palace contains what remains of the ancient palace of the Czars, and the new palace, founded in 1743, burned in 1812, rebuilt in 1816, and since that time successively altered and enlarged. The cathedral of the Assumption of the Virgin, founded in 1326, is esteemed the most splendid in Moscow. It is crowded with an incredible number of images, pictures, and relics. The Russian sovereigns are here crowned and anointed. The cathedral of St. Michael contains the tombs of nearly all the Russian Czars and royal personages. The cathedral of the Annunciation is smaller than the preceding, but built in better taste, and, being splendidly ornamented, is a pleasing and magnificent object, forming as it were a wing to the palace. The cathedral of the Transfiguration is a very plain and nearly square edifice, founded in 1328, and rebuilt in 1527. Including the cathedrals, there are 32 churches in the Kremlin. After the cathedrals, the Ivanovskaya Belfry claims attention for its size and magnificent appearance. This tower is 269 feet high from the bottom to the top of the cross. Besides many other bells, there is in this belfry the great bell, which weighs 360,000 lbs. The Kremlin contains likewise the imperial museum, the arsenal, and the palace of the patriarch. The present emperor has built a magnificent church for all Russia, a new palace, and has made great improvements in the ancient palace of the Czars.

II. The *Kitai-Gorod*, surrounded by a wall with 12 towers and 5 gates, is properly the city. The houses, which are mostly of stone or brick, are built close to each other, contrary to the usual mode. It is the centre of the trade of Moscow; and contains the bazars, the magazines, and the richest shops. The chief public building is the Pokrovskoi cathedral, built in 1554, which was originally so constructed as to have also nine separate churches or chapels, to which eleven more have been since added, so that there are now twenty-one places of worship joined together, in which divine service may be performed at the same time. Among the other public buildings, are the town-hall, and the printing-office of the holy synod.

III. The *Beloi-Gorod*, or White Town, contains, besides many fine palaces of the nobility, several remarkable edifices, such as the university, the medico-chirurgical academy, the foundling-hospital, the post-office, college of foreign affairs, the residence of the governor-general, the exercise-house, the assembly-rooms of the nobility, three monasteries, three nunneries, and numerous churches.

IV. The *Zemlianoi-Gorod*, or Earthen Town, was erected in 1618. In its place there are promenades planted with trees. In this division are the depôt of the commissariat, the depôt for spirits (a government warehouse), the Imperial Philanthropic Society, the Moscow Commercial School, and the Medico-Chirurgical Academy.

V. The *Slobodi*, or suburbs, thirty-five in number, form an immense irregular polygon, completely surrounding the Zemlianoi-Gorod. Part of the suburbs consist of stone houses and wooden houses, intermixed with superb mansions and mean hovels; but many of the suburbs are like villages, with uninclosed pastures, corn-fields, and

waste lands. Among these suburbs are to be found Catharine's Barracks, the military hospital, Galatzin's hospital, Sheremetof's hospital, and many very large monasteries, some of which contain three or four churches.

Moscow is the residence of two archbishops, and contains, besides the several government offices and public institutions already mentioned, the most important manufactories in the empire. It is the centre of the whole internal trade, and is the depository of large quantities of merchandise of every description. It is also the residence of most of the Russian nobles, especially in the winter.

MOSELLE, a department in France formed out of the district of Messin, French Luxembourg, and part of Lorraine, is bounded N. by Belgium, Dutch Luxembourg, and Rhenish Prussia, E. by Rhenish Prussia and Bavaria, S. by the departments of Bas-Rhin and Meurthe, and W. by the department of Meuse. Its greatest length from E. to W. is 102 miles; its breadth is very irregular, being not more than 5 miles a little E. of Sarreguemines, but the average is about 25 miles. The area is 2057½ square miles, and the population in 1846 was 448,087; which gives 217.78 to the square mile, being 44.03 above the average per square mile for all France.

The surface is in general uneven. The hills, which in the east of the department are offshoots from the Vosges Mountains, and in the west from the Ardennes, are of gentle slope, and nowhere exceed 650 feet in height. Their summits are covered with forests containing good ship-timber, and their sides are planted with fruit trees, or laid out in vineyards, which yield wine of good quality. There are no plains properly so called in the department, unless that term be applied to the plateaus formed by the upper surface of some of the highlands. The river valleys are all narrow; the finest of them is that watered by the Moselle, which for beauty of scenery and richness of soil is seldom paralleled, especially that part of it that extends from Metz, where the inclosing hills take a wider sweep from the river bank, to Sierck where they again mutually approach.

The department is named from its principal river the Moselle, which rises in the south-eastern angle of the department of Vosges, and running nearly N.W., passes Remiremont, Épinal, and Charmes. A few miles below this last town it enters the department of Meurthe, which it traverses in the same direction as far as Toul, whence it flows N.E. to its junction with the Meurthe, about 8 miles N. of Nancy; from this point its course is nearly due N. past Pont-à-Mousson, below which it enters the department of Moselle, where it passes Metz, Thionville, and Sierck, near the Prussian frontier. The Moselle, on passing out of France, forms for above 20 miles the boundary between Rhenish Prussia and Dutch Luxembourg, then taking a decided north-eastern course through Rhenish Prussia, it passes Treves, and after many windings through vine-clad hills enters the Rhine at Coblenz. The Moselle has a length of 320 miles, of which 182 are in France; it is available for floating timber almost from its source to its junction with the Meurthe, whence to its mouth, a distance of 210 miles, it is navigable; 72 miles of this navigation are in France. Steamers ply up and down the stream between Metz and Treves, Treves and Coblenz: the up-navigation is very tedious, owing to the rapidity of the current. The basin of this river is, with the exception mentioned in the last paragraph, very narrow; and the scenery is very beautiful. The river is subject to inundations, which sometimes cause great ravages. Timber, building stone, iron, fire-wood, coal, slates, corn, wine, oak staves, planks, charcoal, &c., are the articles chiefly carried on its waters. The principal feeders of the Moselle on the right bank are—the Valogne, the Meurthe, the Seille, and the Sarre; on the left bank the Madon, the Math, the Orne, the Sure, the Kil and the Elz.

The valleys and hill-sides of the department are covered in general with a rich soil, and are carefully cultivated so as to yield great quantities of wheat, rye, and oats, of which a considerable surplus over the home consumption is sold for exportation in the great corn-market of Metz. Other crops raised are vetches, millet, peas, beans, and lentils. Improved methods and implements of agriculture are being adopted, but slowly. The vine is cultivated; but, with the exception of the white wines made near Metz, which are of good quality, the wines of the department are not as good as they might be. This is said to be owing to want of attention in the choice and management of the vine plants, to a negligent and indiscriminate gathering of the grapes, and to an obstinate adherence to old modes of manipulation the wines, which with proper care might be made to rival those of Champagne; indeed several Champagne wine merchants, settled at Metz purchase Moselle wine, and manufacture from it what they call champagne wine for the German and Russian markets. Gardening is carried on extensively, and brought to considerable perfection melons are abundant; pears, peaches, and other fruits are grown in large quantities, and exported in the form of dry, liquid, and crystallized conserves from Metz, where preserved fruits form an important article of commerce. Flax is extensively grown both for the sake of the fibre and of the seed, which is pressed for oil; rape and turnips are also grown. The forests consist of oak, beech, hazel, &c.; they abound in game, including in this term, roebucks, wild boars, wolves, foxes and wild cats. Bees are very numerous, and much honey is gathered. Horses are of inferior breed, oxen and cows are lean; butter is scarce; cheese bad: sheep are small in size and coarse of fleece. The common fresh-water fish abound in the Moselle and the Sarre.

A portion of the department which projects eastward of Sarreguemines to the Bavarian frontier forms an exception to the general fertility of the soil. Here the potato is almost the only plant that succeeds; the natural pastures are good, but these are frequently covered with sand and stones swept down by torrents from the mountain sides

The climate of the department is on the whole mild; in the north-western and the eastern districts however, which are respectively connected with the Ardennes hills and the Vosges mountains, the air is sharp, and the winters long and rigorous.

Several iron mines are worked, and the ore is smelted and made into malleable iron in 19 furnaces and forges. Lead and copper are found, but no mines are worked. Building stone, quartz, gypsum, crucible and pottery earth are quarried. Marl is found in great masses in the north and north-west of the department, and is extensively used in manure. Plaster-of-Paris is also much used as a top-dressing for meadow land. Fossils abound in the strata of the hills, which are generally calcareous, except in the vicinity of the Vosges, where flint and granite prevail; among other fossils, bones of the elephant and rhinoceros have been found.

The industrial products consist of sheet and bar iron, block-tin, nails, glass, unbleached and table linen, embroidered muslin, canvass, paper, beer, tobacco, oil, starch, room paper, beet-root sugar, tiles, pipes, pottery, leather, hosiery, and common woollen and cotton stuffs. These articles, together with timber and the products previously mentioned, support an active commerce. About 90 fairs are held during the year.

The department contains 1,316,618 acres, distributed among 146,552 proprietors, and into 2,149,155 parcels. Of the whole area 751,012 acres are under the plough; 112,677 acres are grass land; 351,216 acres are covered with woods and forests; 29,456 acres are laid out in gardens, orchards, and plantations; 16,287 acres consist of heath and moor land; 30,227 acres are occupied as roads, streets, squares, &c.; and 7,759 acres with rivers, canals, and ponds.

The department is divided into 4 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Metz . . .	9	210	164,378
Thionville . .	5	113	88,858
Briey	5	120	65,630
Sarreguemines.	8	128	129,221
Total . .	27	571	448,087

Of the arrondissement of Metz, and of the whole department, the chief town is METZ. *Boulay*, a well-built little town, with a handsome square and a large richly decorated church, is situated on the slope and at the foot of a hill between the Nied and the Katzbach, and has 2670 inhabitants, who manufacture broad-cloth, blankets, glue, ivory black, saddle-trees, hardware, foil blades, cotton twist, and leather.

In the arrondissement of Thionville, the chief town *Thionville*, surrounded with ramparts and entered by three gates, stands 17 miles N. from Metz on the Moselle, here crossed by a covered bridge, and has a tribunal of first instance, a college, and 8246 inhabitants. It stands on level ground, and has wide but irregular streets, with solidly built houses, some of which date from the 16th century. The Place-d'Armes, or drilling-ground, is a handsome square, surrounded on three sides by barracks, and on the fourth by a large riding-school. Among the most remarkable buildings are—the parish church, the corn-market the theatre, the hospital, and the town-house, near which there is a good botanical garden. Hosiery is the chief manufacture of the town; in the environs there are numerous spirit distilleries, iron foundries, glass-works, tan-yards, and breweries; there is also a good trade in corn, hemp, and flax. *Bouzonville*, very prettily situated E. of Thionville, on the Nied, has a population of 2160. *Sierck*, a walled town, defended by a castle, is situated at the foot and on the slope of a steep hill, on the right bank of the Moselle, near the Dutch and Prussian frontiers, and has 2189 inhabitants, who manufacture eau-de-cologne, glue, and leather, and have a good trade in wine, timber, hides, ribands, and hardware.

In the arrondissement of Briey, the chief town *Briey*, a small place of about 2000 inhabitants, and the seat of a tribunal of first instance, is situated in the west of the department, on a small stream that runs into the Orne. *Longwy*, in the north of the department near the Belgian frontier, 22 miles N. from Briey, is a fortified town, built on a hill, not far from the left bank of the Chiers, and has a population of 4197, who manufacture calico, table covers, lace, pottery, beer, and leather. The upper town, which is the fortified part, is well built, and contains a good town-house, a handsome church, an hospital, and several deep wells, which supply it with water. The lower town is built below the southern escarpment, and contains several old monasterial buildings, the dark appearance of which forms a striking contrast with the handsome country houses that stud both banks of the Chiers.

In the arrondissement of Sarreguemines, the chief town *Sarreguemines, or Saar-Guemund*, is built in a pretty situation at the confluence of the Sarre and the Bélise, 42 miles E. from Metz, near the Bavarian frontier, and has a tribunal of first instance, a college, a custom-house, and 4865 inhabitants. The most notable buildings are—the old capuchin convent, which now serves as a residence for the sub-prefect, as a court-house, and college lecture-rooms; and the prison. This town is the centre of a great tobacco manufacture, which is carried on in the adjacent villages; other industrial products are earthenware, glue, silk, velvet, and plush. The trade in corn, canvass, fruits, timber, &c., is considerable. *St.-Avold*, 20 miles W. from Sarreguemines, stands in a hilly country on the Roselle, and has 3403 inhabitants. It is a pretty little town, and has dye-houses, tile-works, tan-yards, and manufactures of swan-skin and Prussian blue. *Bitche*, a small fortified town, which commands the defile of the Vosges mountains between Weissenbourg and Sarreguemines, stands 16 miles E. from Sarreguemines, and has 3911 inhabitants. The town is well-built in shape of a half-moon. The citadel, built on an isolated rock near the centre of the town, is considered a masterpiece in the art of fortification.

In the environs of Bitche there are glass-works, the products of which are in great request. *Forbach*, 12 miles N.W. from Sarreguemines, stands in a hilly and woody country, near the Prussian frontier, and has 4288 inhabitants, who manufacture pipes, iron chains, soap, leather, and glass. The town, which was formerly defended by a strong castle, now in ruins, is ill-built, with narrow, crooked, and steep streets. It has a custom-house, and is one of the principal outlets between France and Germany in this part. *Sarrealbe*, situated in a fine grazing country, 10 miles S. by W. from Sarreguemines, at the confluence of the Sarre and the Albe, has 3434 inhabitants, who manufacture household linen, straw hats, tobacco, and steel.

The department forms the see of the bishop of Metz; is included in the jurisdiction of the High Court and University Academy of Metz; and belongs to the 3rd Military Division, of which Metz is head-quarters. Under the late monarchy it returned 6 members to the Chamber of Deputies; it now has 9 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1849.)

MOSER, GEORGE MICHAEL, R.A., was born at Schaffhausen in Switzerland, in 1704. He came to London, and obtained a high reputation as a gold chaser. He was also an excellent medallist and a good painter in enamel. On the foundation of the Royal Academy in 1768, Moser was made keeper. He died in the beginning of 1783, and Sir Joshua Reynolds wrote an eulogium upon him, which is printed in Malone's Life of Sir Joshua.

Mary Moser, his only daughter, was a distinguished flower painter, and is the only lady, besides Angelica Kauffman, who has ever been elected an Academician. Mary Moser decorated an entire room with flowers at Frogmore for Queen Charlotte, for which she received 900*l*. She died in 1819.

MOSES, the lawgiver of the Hebrew people, was an Israelite of the tribe of Levi, and the son of Amram and Jochebed. He was born in Egypt, in the year 1571 B.C., according to the common chronology. To evade the edict of Pharaoh, the king of Egypt, that all the male children of the Hebrews should be killed, he was hid by his mother three months, and then exposed in an ark of rushes on the banks of the Nile. Here the child was found by Pharaoh's daughter, who adopted him for her son, entrusting him to his own mother to nurse, by which circumstance he was preserved from being entirely separated from his own people. He was probably educated at the Egyptian court, where he became 'learned in all the wisdom of the Egyptians.' At the age of forty years Moses conceived the idea of freeing his Hebrew brethren from their bondage in Egypt, and on one occasion, seeing an Egyptian (probably some officer) maltreating an Israelite, he interfered, slew the Egyptian, and buried him in the sand. The next day, upon his attempting to reconcile two Hebrews who had quarrelled, his services were scornfully rejected, and he was upbraided with the murder of the Egyptian. Finding that his secret was known, he fled from Egypt, and took refuge with a tribe of Midianites in Arabia Petræa, among whom he lived as a shepherd forty years, having married the daughter of their priest Jethro or Reuel (Exod. ii. 11–22; Acts vii. 23–30; Heb. xi. 24–27.)

The gap left by the Scripture narrative in the early history of Moses has been filled up by Josephus, Philo, and other writers, with various legends, some of them highly improbable, of which an outline is given in Milman's 'History of the Jews.' The history of the mission and the legislation of Moses are recorded in the Pentateuch, on which there are many excellent commentaries, among which we may mention Dr. Kitto's 'Bible History.'

MOSHEIM, JOHANN LORENZ VON, was born of a noble family at Lübeck, October 9, 1694. He was educated at the gymnasium of Lübeck and the university of Kiel. He was professor of theology in the university of Helmstedt from 1725 till 1747, when he was appointed professor of theology at Göttingen, and chancellor of the university. He died on the 9th September, 1755. He was thrice married. By his first wife he had two sons and one daughter, and by his third wife one daughter, afterwards duchess of Noailles.

Mosheim was greatly distinguished as a preacher. His style was formed on the model of the great English and French preachers, Tillotson and Watts, Saurin, Massillon, and Fléchier. His talents were of a very high order, his learning was immense, and his character was exemplary.

The whole number of Mosheim's works is 161. His best known work is the 'Institutionum Historiæ Ecclesiasticæ, Antiquioris et Recentioris, libri iv.' This work, which is written in Latin, was first published in 2 vols., 12mo., in 1726, and the enlarged edition was published in 4to, in 1755, just before Mosheim's death. Another edition was published in 1764, with an account of Mosheim's writings by Miller, one of his pupils. It was translated into German by Von Einem, and by J. R. Schlegel. Schlegel's translation is the better, and is enriched with valuable notes. In 1832 a good English translation, with valuable notes, was published by Dr. Murdock, of Newhaven, Connecticut, United States. Mosheim's 'Ecclesiastical History' extends from the birth of Christ to the beginning of the 18th century.

MOSQUE, a Mohammedan place of worship, the distinctive exterior marks of which are generally cupolas and minarets. The interior is a large hall, without seats.

MOSQUITO. [CULICIDES.]

MOSQUITO COAST. This country extends along the coast of the Caribbean Sea, from Cape Camaron, 15° 57′ N. lat., 85° W. long., to the mouth of the San Juan de Nicaragua, 10° 55′ N. lat., 83° 47′ W. long. The line which separates the territories of the Mosquito Coast from the states of Honduras, Nicaragua, and Costa Rica, has not been fixed.

The most northern portion of the coast-line is

high, but the remainder of the shore is low. Along this low line of coast a series of keys occur from 10 to 35 miles from the shore. They are somewhat dangerous to inexperienced navigators, but shelter that narrow part of the sea which lies between them and the mainland from the oceanic swell. Along the low coast the country is a level plain, slightly elevated above the sea, but on proceeding farther inland it rises in terraces, and here the plain is frequently interrupted by depressions and by elevated tracts which are connected with the mountain ranges. The terraces are furrowed by valleys scooped out by the currents of the rivers. The lower portions of the country are savannahs, without trees and frequently without bushes, but where the country rises and forms hills, it is overgrown with trees. In the vicinity of the sea the soil of the savannahs is light. The whole country, as far as it is known, presents a continual alternation of wooded lands and prairies.

The Mosquito Coast is drained by numerous rivers. Many of them are navigable to a considerable distance from their mouths, but the navigation is frequently impeded by the trees which are brought down during the rains. Most of the embouchures of the rivers form harbours, which however are only accessible to small vessels. Blewfield River, which falls into the lagune of the same name (12° N. lat.), and is said to run upwards of ninety miles, rises within the state of Nicaragua. Wanks or Segovia River also rises in Nicaragua, where it passes near the town of Matagalpa and Segovia. It is said to run 250 miles. Its mouth is near the Bay of Cape Gracias a Dios. It is said to be navigable to the boundary-line of Nicaragua. The San Juan issues from the Lake of Nicaragua, and at its mouth is Grey Town, the seat of government, though only a recent acquisition, having till lately formed a disputed part of the territory of Nicaragua.

The lagunes are a peculiar feature of this country. They are not shallow and stagnant collections of water, but deep lakes, connected with the sea by one or more straits, by which the tide enters them. They generally receive one stream, frequently several streams, and therefore a current is always observable, which sometimes runs strongly. Near the entrance of the lagunes the water is brackish, but in the interior it is quite sweet. The most extensive, from south to north, are, Blewfield Lagune, into which the Blewfield River falls, 50 miles long, and from 8 to 15 miles across, and Pearl Key Lagune, which is 60 miles long, and from 16 to 20 wide.

The climate somewhat resembles that of Jamaica. The wet seasons extend from November to February, and from the middle of June to the end of July, the dry seasons being the intermediate periods. On the coast the rains are heavy, but very short; they are however attended with heavy thunder-storms. In the coldest months (from September to February) the temperature varies between 66° and 70°, but descends occasionally to 62°, and even to 60°. In summer the thermometer ranges between 75° and 84°, sometimes rising to 86°. The climate is healthy.

Vegetation is as vigorous as in any country between the tropics. The natural productions, vegetable and animal, are similar to those of other parts of Central America.

The majority of the inhabitants do not materially differ from the other savage tribes of America. All the tribes, though they speak different dialects, distinguish themselves from other nations by the name of Misskitos, which the Europeans have changed into Mosquitos.

The commerce of the Mosquito Coast is carried on by a few English families which are settled there. They receive European goods for the market, commonly from Belize. The first settlement of Englishmen on this coast dates from 1730, when some families settled at Cape Gracias a Dios on Black River and at the mouth of Blewfield's River. In 1813, when the States of Central America acquired their independence, that of Nicaragua claimed the Mosquito Coast as a portion of its territories, but these claims were rejected by England and the king of the Mosquitos. The king, whose power is absolute, granted different districts, one of which was Poyais, with almost sovereign power, to some Englishmen.

MOSSES. [MUSCI.]

MOSUL or MOZUL, a town of Turkey in Asia, in 36° 20′ N. lat., 43° E. long., is situated on the right or western bank of the Tigris, about 230 miles N.N.W. from Bagdad. Mosul is the centre of an extensive commerce between Bagdad and the towns of Armenia, but the only manufacture now carried on to any extent in the town is that of coarse blue woollen cloths. The population, which is computed at about 60,000, consists chiefly of Arabian, Turkish, and Kurdish Mohammedans. The Christians are about 10,000, and the Jews about 1000. Mosul is governed by a pasha of two tails. The town is surrounded by a wall. The streets are narrow and unpaved. There are numerous baths, bazaars, coffee-houses, and about 30 mosques. A bridge connects the town with the eastern bank of the river, where the ruins of the ancient Nineveh exist, which have been lately explored by Mr. Layard.

MOTET, in Music, a vocal composition set to sacred words, and used in the Catholic church. The word was synonymous with anthem, when first introduced, and signified a superior kind of hymn, accompanied only by the organ. Latterly however the Motet has lost much of its primitive solemnity.

MOTH, the English name of the insects belonging to the section of the Lepidoptera called *Nocturna*. [LEPIDOPTERA.]

MOTHE-LE-VAYER, FRANÇOIS DE LA, was born at Paris, 1588, and in 1625 succeeded his father as substitute to the procureur-général; but he soon abandoned his profession to pursue his favourite study of history. In 1639 he was admitted into the Academy. In 1649 he was entrusted with the education of the young Duke of Orleans, whose astonishing progress under his tuition induced the queen to confide to him the completion of the king's (Louis XIV.) education. He died in 1672. Of his numerous works, the most important are: 'Discours de la Contrariété

d'Humeurs qui se trouve entre certaines Nations, et singulièrement la Françoise et l'Espagnole,' 'Considerations sur l'Eloquence Françoise,' 'De l'Instruction de Mons. le Dauphin,' 'De la Vertu des Païens. Several collections of his works have been made; but the best is that of Dresden, 1756–59, 14 vols. 8vo.

MOTHER-WATER. When any saline solution has been evaporated so as to deposit crystals on cooling, the remaining solution is termed the Mother-Water, or sometimes merely the Mothers.

MOTION is change of place. There has been motion when a body, at one time, occupies a part of space different from that in which it was at a preceding time. The only additional necessary conception is continuity of change: every point which has moved from one point of space to another must have passed over every part of some line, straight or not straight, drawn from one point to the other.

Some of the ancients used the word in a more general sense, answering to change. Thus, according to them, creation, generation, corruption, increase, diminution, and change of place, are the six sorts of motion. We have here no further to do with this than to remind our readers, when they see *local* motion spoken of in old writings, that this is the term by which simple change of place, to which the word motion is now restricted, is distinguished from the other changes which the same word then denoted.

If we consider merely motion, without any reference to the matter moved or the quantity of external force required to move it, we have, as we conceive, a subject of pure mathematics before us, though this has been contested. Newton however used considerations of motion without hesitation in his fluxions; and his successors have endeavoured to avoid them by circumlocutions, which, however consonant they may be to conventional ideas of rigour, have never failed to introduce perplexity and obscurity to the beginner.

But if we consider matter in motion, we must inquire into the external causes of motion, and the capabilities of matter with respect to motion. This we shall do in the article MOTION, LAWS OF, confining ourselves for the present to the first-mentioned branch of the subject.

Next to the idea of motion comes that of swiftness, rate of motion, or velocity, suggested by observing different motions, or different changes of place in the same time. [VELOCITY.] But here we must observe, that we are rather indebted to motion for our measure of time than to motion for our measure of motion. If sentient beings, like ourselves, had lived in perpetual day, without any recurrence of periodical phenomena in nature, or any mechanical means of generating equable motion, we have no right to suppose that they would ever have learned to consider time as a measurable magnitude. They might admit that it might be more or less, as we do of industry, courage, or any other moral qualities, but we cannot be more destitute of measures for those qualities, than they would have been of means for measuring time. Since however we have obtained, though by means of equable motion, a distinct idea of successions of duration equal in magnitude, we use this idea in the definition of motion. Considering the motion of a simple point, which describes a line, it is called uniform when the lengths described in successive equal times are equal, *whatever each time may be.* It is important to remember this, since different successive motions may be uniform in some respects and not in all. Thus successive revolutions may be performed in equal times, as to whole revolutions, but equal fractions of one revolution may not be performed in equal times. In uniform motion, an arbitrary unit of time is chosen, and the length described in that time is called the *velocity*, which is simply the Latin for *quickness.* If extreme verbal correctness were required, this length should be called, not the velocity or swiftness, but the measure of the velocity. For the length described in (say) one second is not the velocity or swiftness, but something by which we judge of it. The word velocity is an abstraction from the comparison of motions; of two moving points, that one which described the greater length in a given time moved the quicker: and swiftness is the absolute substantive by which we express the existence of the obvious relation, just as magnitude is that by which we express the existence of the relation of greater and less.

When equal spaces are not described in equal times, we can imagine the rate of motion to change either gradually or discontinuously. Thus it can be imagined that a body which moves for some seconds uniformly at the rate of 10 feet in a second, may at once, without any intermediate state, take a velocity of 20 feet. But such a conception cannot be realised on any material body, though there may be all the appearance of it. When the rate of motion is changing perfectly gradually, there seems to be no direct method of obtaining the rate at any one instant; for no successive equal spaces are described in equal times. For our present purpose however it may be sufficient to take a length so small that the change of rate undergone in passing through it is insensible, and to consider the point as moving uniformly through that length. Let the very small length s be described in the small fraction t of a second; then $s : t$ is the length which would be described in one second at the same rate, since $t : 1 :: s : (s : t)$, and $s : t$ may be taken for the velocity.

The existence of a motion is detected either by a change of the distance of an object, or of its direction, or both; but it is not necessarily the object which moves. The spectator himself may be in motion unconsciously, and it is matter of common experiment that every motion of the spectator of which he is not conscious, and every rapid motion, whether he be conscious of it or not, causes surrounding objects to appear in motion. In walking, the effort necessary to maintain motion perpetually reminds us that it is ourselves who move; in a carriage, at an ordinary pace, we can always destroy the illusion of surrounding motions by a moment's thought. But if the attention drop, and we look at objects with the

mind intent on other things, they soon take the motion of the carriage in a contrary direction. In the smooth motion of a boat, no effort of thought will enable the spectator to realise his own motion, and destroy that of the shore or a neighbouring vessel. We state that which we find to happen to ourselves. Perhaps the experience of other persons may be different.

It may also happen that the object is in motion as well as the spectator, in which case the latter motion will be transferred to the former. The whole motion of the object, compounded of that which it has of its own, and that which it appears to have from the motion of the spectator, is called the *apparent* or *relative* motion. For the mode of compounding motions see the 'Penny Cyclopædia,' art. 'Motion.'

MOTION, DIRECTION OF. We have inserted this article, not for the sake of rectilinear, but of circular motion, the consideration of which is apt to cause some embarrassment to the beginner. In motion along a given right line there can be but two directions, in one or other of which the course must be; and these two directions are opposite to one another. But in circular or other rotatory motion, all imaginable directions are taken in the course of a revolution, and whatever linear direction the moving body takes at any one point, it has the opposite direction at the opposite point. Still however there are two ways of moving on a circle: the motion may either be from C to A through B, or from A to C through B; A B C being three successive points on a circle. These are called, somewhat improperly, different directions of motion.

MOTION, LAWS OF. The laws of motion mean those universal methods of receiving and losing motion which close attention to mechanical phenomena, coupled with strict inductive reasoning, has shown to be inherent in the constitution of matter.

If an intelligent observer, not used to inductive reasoning, nor instructed in the results of mechanics, were required to state the views which experience had taught him of the constitution of matter, as an agent or patient in the production or reception of motion, he would perhaps reply as follows: Matter seems to have no power of moving itself, though if we judge from the fall of bodies towards the earth, the phenomena of magnetism, &c., it would appear as if matter might be the cause of motion in other matter. And it seems moreover that motion is an accident of matter which diminishes and dies out of itself if some sustaining cause be not perpetually in action; for in all cases in which the experiment can be tried, we find that moving bodies are reduced to rest by being left to themselves. The motions of the heavenly bodies, it is true, appear to be permanent; but we have no certain assurance that there is not a constant sustaining *physical* cause of this permanency. There would be something of truth, and a good deal of falsehood in the preceding conclusions.

We shall begin by the assumption that those laws of motion which are to be found in all works on mechanics are true; the reason for such assumption being, that if we take them for granted, and use them as the basis of a mathematical system of mechanics, all results of that system, however many the links in the chain of deduction, are found to agree with observed phenomena in species, and as nearly in magnitude as the various resistances and disturbances will allow.

It will make some difference in our method of seeking for these laws, whether we suppose the earth to be at rest or in motion. Now the decisive proofs of the motion of the earth, as it happens, are themselves derived from certain consequences of the laws of motion. [MOTION OF THE EARTH.] We seem then to be reasoning in a vicious circle; nor do we see any mode of escape except by establishing the truth of these laws, whether the earth be at rest or in motion. And the process will be, first to detect laws for which there is a high and almost overpowering degree of probability in their favour; next to appeal to the abovementioned uniform truth of the results deduced from the assumption of such laws for the conversion of this high state of probability into one of absolute demonstration.

We will first assume the motion of the earth: every point of its surface then is in a state of revolution round the axis, while at the same time the whole is carried forward round the sun; to which we must add, the slight motion arising from the precession of the equinoxes, and the possible translation of the whole system. But this motion is very different in different parts; at the pole, for example, there is no diurnal motion, near it only a small one, and at the equator a considerable one. Our first idea might be, then, that at the different parts of the earth some modification of general laws would be observed, arising from the difference of the motions of the several places. It would not surprise a person wholly unacquainted with mechanics, to whom the preceding facts were stated for the first time, if he were told that some mistakes were made in the pointing of guns in our Indian battles, arising from the artillerymen having been trained by officers who had learnt their art in the latitude of Addiscombe, near Croydon, in Surrey, and had forgotton to allow for the difference in the diurnal motion of the two countries. Now the first law of motion which we can establish (though usually called the *second*) arises from it never having been observed that any notice need be taken of the difference of place on the earth in estimating effects of motion. It is not found necessary to write different treatises on gunnery for different latitudes, nor to alter the disposition of parts in any machine moved from one latitude to another to produce a more advantageous effect. There is, it is true, a small diminution in the weight of bodies, as they are carried toward the equator, and the results of this are apparent in experiments in which the acquisition of motion depends upon weight, or rather, upon its proportion to the quantity of matter. But this very problem of the pendulum is one in which the question of the truth of the laws of motion is established by a test which would detect the smallest quantities, and furnishes

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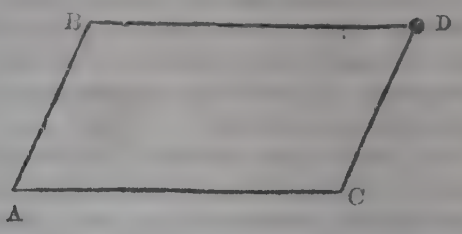
an answer to those who might say that the possible effects of the difference of diurnal motions, though not distinguishable in such cases as that of a cannon-ball, might be perceptible in delicate instruments.

If to the motion of the earth we superadd another, such as the motion of a carriage, the same sort of result is found. Those who move on a railroad at the rate of 30 miles an hour, or 45 feet in a second, do not find the relation in which they stand to the objects in the carriage in any degree changed by the motion. At the instant of taking the motion, or on any sudden jolt or change of motion, effects may be produced to which we shall frequently refer: but when the speed is once obtained, it is well known that a person might occupy himself in reading a work on mechanics written on *terra firma* (so called), and might verify all the experimental conclusions, without coming to any result which would remind him of the difference of state between the writer and himself, as to motion. Hence we are led to the conclusion that all the relations of matter to matter remain unaltered, if the whole system be made to move, provided that the same motion be communicated to all its parts. And though we do not, absolutely speaking, know what rest is, since no point of the earth, nor of any heavenly body, can be shown to be at rest, yet since we see that the relations remain unaltered when the velocity of a whole system is changed, we are led to conclude that the same laws which prevail when all the parts of a system have the same motion, would also prevail if the whole system were at rest; the ground of our presumption being, that the laws remain unaltered under any alteration of the common motion which it is in our power to make.

Let us now suppose that the carriage, instead of moving in a right line, is carried on a curved road, say a simple circle. It is no longer observed that loose objects in the carriage have a tendency to repose relatively to the carriage itself. If the motion become sufficiently rapid, or the friction of the substances on which they stand be sufficiently small, they will endeavour to move outwards, or from the centre of the circle of motion. This phenomenon can be made a consequence of the laws of motion, when the latter have obtained their simplest form. We do not at present enter into this subject further than to point out that it is only of rectilinear motions we can predicate any law as descriptive of what is inherent in matter. We have, it is true, already spoken of circular motions in taking into account those of the earth; but it must be remembered, firstly, that the circles in question are so large, that a small arc of any one is nearly a straight line; secondly, that we have been obliged to advert to this tendency outwards, which is the reason of the diminution of weight (or of much the greater part of it) detected from the oscillations of a pendulum which is carried towards the equator.

The second law of motion (for such it is called, though it must be deduced first when the earth's motion is considered) may be thus stated:—If there be two or more causes of motion, taking place in two different right lines, whether inherent in the body or external to it, their effects do not interfere, nor does either diminish or augment the effect of the other. If, for instance, the body



A be subject to two actions, one of which, being entirely in the direction A B, would bring the body to B in a given time, and the other, entirely in the direction A C, would bring it to C in th same given time; then the body will move from A to D, precisely as it would have done if, moving along A B in the manner first specified, the line A B had been translated with its extremity A moving in the second manner specified, the said line A B not changing its direction.

The most simple and general method of stating this law is as follows: — The distance of a point from a straight line or plane, measured in any given direction, and as it will be at the end of a given time, is not affected by the action, during that time, of any causes of motion, provided they act in the direction of or parallel to that straight line or plane; or no force, in a given direction, can produce motion to or from a line in that direction. Thus if a ball were thrown up in still air, in such a manner that it would mount 50 feet in one second, no imaginable horizontal current or whirlwind, however much it might alter the actual course of the ball, would prevent its rising 50 feet in the second. The statement of the law by Newton, namely, that when a force acts upon a body in motion, the change of motion which it produces is in the direction and proportional to the magnitude of the force which acts, is perhaps rather too vague to give a distinct notion to learners.

From the law just enunciated, we may learn that bodies upon the earth, moving with the earth, have the properties of bodies at rest with respect to all motions that are to be estimated relatively to the earth: at least upon the supposition that the curvature of the motions of the earth is not sufficiently great to produce a sensible effect. We have then to inquire what is the natural state of matter on the earth? Can it preserve any motion of itself, or does every motion gradually slacken and die out, by the mere inability of matter to maintain it without the application of external causes? On this point we have only strong presumptions, which would be by themselves insufficient. We find that terrestrial matter, immediately on its being put in motion, encounters causes of retardation. The resistance of the air, and the friction of the bases on which the substances rest, are easily shown to lessen the motion of bodies which encounter them. The more nearly these are removed, the longer does motion continue. It is certain then that these resistances contribute in a great degree to the destruction of motion; but it is not therefore to be immediately assumed that there is no other cause. If we grant that a perfectly smooth

ball, lying upon an indefinitely extended plane without friction, and not in contact with any atmosphere, would move for a long time without any sensible diminution of the rate with which it was made to set out, we grant quite enough to explain all that we see, without the necessity of supposing that the motion would continue for ever. How then can we establish the first law of motion (so called), which is thus stated, that matter will retain its state of rest, or of motion, for any length of time, however great, until acted upon by some external cause? We must here appeal to the results of the application of this law, which have never, in any one instance, exhibited any reason to suspect that it is only approximately true. We shall not here go into the details of these consequences; the conclusion is, that the state which matter, independently of external bodies, has been created capable of maintaining, is not merely rest, but also uniform motion in a straight line; so that it has no more tendency of itself to part with any of its velocity, nor to move slower or faster than it was first made to move, than it has to set itself from rest into motion.

If the earth were supposed to be fixed, we might obviously (though not obliged to do so) begin from matter at rest, and establish first that law of motion which usually stands first.

The third law of motion was enunciated by Newton as follows:—'Action and reaction are equal and contrary;' which requires a definition, and this definition will require the statement of the principle, or something amounting to it, in a more definite form. We may readily suppose that when matter communicates to other matter motion which the latter had not before, the former must lose some of its own. On any other supposition, the connection of matter with other matter would create motion. But this it would seem to do in the case of attraction, so that the *primâ facie* objection to the supposition of matter creating motion seems to be answered by an instance. It must however be observed that in every case of nature, the creation of motion by attraction is accompanied by the creation of an opposite motion. If a magnetic and non-magnetic needle be placed in water, not only will the magnetic needle move towards the other needle, but the other needle towards the magnetic needle. It appears then that opposite motions are to be considered as contrary effects; and, if applied to the same body, we know that they would destroy one another. In like manner then, as, in considering the first law of motion, we have to learn that maintenance of uniform velocity must be looked at as inherent in matter, and as not arising from external causes; so in the third we are taught to consider opposite velocities as negations each of the other—so that the creation of both is equivalent to the creation of neither, and not, as might be supposed, requiring two new and distinct causes of motion. In like manner, if A were to lend a sum to B, which C was to stand engaged to repay, a credit and a debt would be created which did not before exist, the whole stock of the community remaining unaltered.

But the most essential part of the principle is derived from observation of the fact, that other things remaining the same, the more matter is moved, the more slowly is it moved. If the magnetic and non-magnetic needles be of equal mass, they will at the end of any time have equal and contrary velocities; but if the magnet be double of the other, it will in the same time acquire only half the velocity. In fact, confidently as we feel entitled to expect that, in some sense or other, action and reaction will be found equal and contrary, we have not learnt the meaning of the word action as long as we think only of velocity, and not of the quantity of matter in which velocity is created. A cause of motion once existing, and which was entirely expended in giving a velocity of 100 feet per second to a ball of two pounds weight, would have given 200 feet per second to a ball of one pound weight. Hence it is *Momentum* which is the measure of the action of matter upon matter, and the definite enunciation of the third law is as follows:—Whenever any matter gains momentum in one direction, other matter either loses as much momentum in that direction, or gains as much in the contrary direction. Action then is creation or destruction of momentum; reaction is destruction or creation: while the destruction of momentum in one direction, and its creation in the contrary direction, are equivalent effects.

The absolute strictness of this law, probable as it is rendered by terrestrial observations, is proved in the same way as that of the others, namely, by the observation of the conformity of its legitimate deductions with observed facts.

The three laws of motion, then, may be thus enunciated:—

1. Matter, unacted on by other matter, preserves the state which it had when action last ceased, that is to say, remains at rest, if it were then at rest, or if it were then moving, continues to move with the same velocity, and in the same direction. Rest, or uniformity of direction and velocity, can be maintained without the continuance of external action.

2. All force, or cause of motion, in any direction, produces its effect in that direction, and in no other; that is, the distance of a material point from any line, at the end of a given time, is unaffected by forces, whatever they may be, which act in that line or parallel to it.

3. Action of matter upon matter is evidenced by the creation of momentum, and measured, in any direction, by the momentum created in that direction: and action is always accompanied by equal and contrary reaction; that is, momentum is never created in any one direction, without a loss of the same momentum in that direction, or the creation of an equal momentum in the opposite direction.

MOTION OF THE EARTH. The theory of gravitation has placed this question on a footing entirely different from that on which it was argued, whether by Aristotelians or Copernicans. Both of the latter parties supposed the existence of a fixed central body somewhere, which the first of them would have to be the earth, and the second the sun. This *centrum mundi*, or centre of the universe, is exploded.

When the work of Copernicus appeared in 1543, it seems to have been considered as a mere attempt to demonstrate or show the motions of the heavenly bodies in a more simple way. Guarded as it was by the expressions of the preface, it was neglected as a purely speculative trial of a strange and impossible hypothesis. Copernicus himself treated his own ideas as a reproduction of those of the ancients, and in truth the existence of such a doctrine as the earth's motion was perfectly well known to all men of learning. Aristotle (in his second book on the Heavens) states that Pythagoras and his followers placed the sun in the centre, on account of the superior excellence which they attributed to the element of fire, of which they supposed the sun to be made. Different authorities give the same opinion (whether with or without the reason) to Philolaus, Anaximander, Nicetas, Seleucus, Cleanthes, Leucippus, Ecphantus, Heraclides, Ponticus, and Aristarchus.

Copernicus had no predecessor as a mathematical reasoner upon the question. The first continental followers of the new system were Rheticus, Reinhold, Mæstlinus the instructor of Kepler, and Urstitius, who was probably the instructor of Galileo. In 1556 appeared in England the 'Castle of Knowledge,' by Recorde, in which a cautious and implied avowal of Copernican principles is made, and also the Ephemeris of John Field, expressly computed from Copernicus and Reinhold. John Dee and his pupil Thomas Digges were both avowed Copernicans: the first absolute defence of the system is contained in the appendix to the 'Prognostication Everlasting,' &c., of Leonard Digges, republished by Thomas Digges (who added the appendix) in 1594. This appendix is called 'A Perfit Description of the Cœlestial Orbes, according to the most Ancient Doctrine of the Pythagoreans; lately reuiued by Copernicus, and by Geometricall Demonstrations approued.'

Hitherto the theological part of the controversy has not made its appearance. We must date this view of the question from the discoveries of Galileo. Neither in ancient nor modern times have those who would bind over the sciences to agree with *their* interpretation of the Scriptures ever taken alarm at hypotheses, until those hypotheses began to have facts in their favour. The inconsistency is worth noting; for taking these objectors on their own principles, there may be impiety (if the Bible be a revelation of philosophy) in propounding a theory which contradicts it; but there can be none in stating the results which follow from actual investigation: the thoughts of the mind of man may contradict revealed science (if such there be), but the works of the God of nature can hardly detect falsehood in the God of revelation. It was Copernicus then, and not Galileo, who was the heretic, if heresy there were in the case; but the former and his immediate disciples slept in peace, while the latter was forced to sign a recantation. [GALILEO.]

The controversy ceases to have any interest after the publication of the 'Principia' of Newton. Even to this day, we believe there are some who deny the earth's motion, on the authority of the Scriptures, and every now and then a work appears producing mathematical reasons for that denial. These works, as fast as published, after making each a convert or two in a country town, are heard of no more until fifty years afterwards, when they are discovered by bibliomaniacs bound up in volumes of tracts with dissertations on squaring the circle, and perpetual motion, and pamphlets predicting national bankruptcy.

We shall now recapitulate some of the arguments against the earth's motion, taking first the scriptural and afterwards the physical.

The scriptural arguments are of two kinds, Copernican and anti-Copernican, for it must be remembered that the asserters of the earth's motion, almost with one accord, admitted the Scriptures as a judge of the controversy.

Psalm xix. 4, 5, 6: 'In them hath he set a tabernacle for the sun, which is as a bridegroom coming out of his chamber, and rejoiceth as a strong man to run a race. His going forth is from the end of the heaven, and his circuit unto the ends of it.' Here it is remarked that the metaphor, where it exists, is explicit, in '*as* a bridegroom,' '*as* a strong man,' but that the words which apply to the sun's motion are absolute assertion.

Ecclesiastes i. 4, &c.: 'One generation passeth away, and another generation cometh; but the earth abideth for ever. The sun also ariseth, and the sun goeth down, and hasteth to his place whence he arose. The wind goeth towards the south, and turneth about unto the north.' In the Vulgate, the last sentence refers to the sun. 'Oritur sol et occidit, et ad locum suum revertitur, ibique renascens gyrat per meridiem et flectitur ad aquilonem.'

Joshua x. 12: 'Sun, stand thou still upon Gibeon, and thou, moon, in the valley of Ajalon. And the sun stood still, and the moon stayed. . . . So the sun stood still in the midst of heaven, and hasted not to go down about a whole day.' It was contended that the earth ought to have been made to stand still, 'if Joshua had been a Copernican.'

2 Kings xx. 11: 'And he brought the shadow ten degrees backwards, by which it had gone down in the dial of Ahaz.' Isaiah xxxviii. 8: 'So the sun returned ten degrees, by which degrees it was gone down.'

Psalm xciii. 1: 'The world also is stablished that it cannot be moved.' Psalm civ. 5: 'Who laid the foundations of the earth, that it should not be removed for ever.'

Job ix. 6, &c.: 'Which shaketh the earth out of her place, and the pillars thereof tremble: which commandeth the sun, and it riseth not, and sealeth up the stars.'

Job xxxviii. 4, &c.: 'Where wast thou when I laid the foundations of the earth? . . . . Whereupon are the foundations thereof fastened? or who laid the corner-stone thereof? . . . . Where is the way where light dwelleth? and as for darkness, where is the place thereof?'

The Copernicans cited the preceding, Job ix. 6, and the following, Psalm xcvii. 4, 'The earth saw, and trembled;' and Psalm xcviii. 7, which

in the English version, is 'Let the sea roar, and the fulness thereof, the world, and they that dwell therein;' but in the Vulgate, 'Moveatur mare et plenitudo ejus, orbis terrarum, et universi qui habitant in eo.' The Ptolemaists replied, with reason, that these texts evidently imply a violent and unusual motion, while all the others speak of stability as the common order of things. We look upon Fromond as, next to Riccioli, the most learned and sensible of the anti-movement party, while Lansberg is certainly not the least of the Copernicans. Yet the latter, to fill up the immense void between Saturn and the fixed stars, states that it is crowded with spirits good and evil, employed in their vocations: the former meets him by the following argument. By the universal consent of theologians, hell is at the centre of the earth: the Creed says that Jesus Christ 'descended into hell;' and St. Paul, in Ephesians iv. 9, that he 'descended into the lower parts of the earth.' The empyreal heaven, and the habitation of the blessed, must be as far as possible from hell; but the former was, by consent of theologians, at the circumference of the universe; therefore, says Fromond, the earth must be at the centre. But Morinus outdoes the rest. From the Creed, he says, it appears that Jesus Christ 'ascended into heaven;' and from the first chapter of Acts, that he was 'taken up.' It is generally thought that the hour of the ascension was noon, at which time, according to the Copernicans, the heads of persons on the earth are towards the centre of the system (the sun). Consequently it was not an ascent, but a descent, for to go towards the centre is to descend. 'I know,' says Morin, 'that the Copernicans have a subterfuge and a fallacy, for they say that the ascent was an ascent with respect to the earth only;' and he goes on to show what shuffling knaves they were for so direct a perversion of plain words. It is however but fair to the anti-Copernican party to add that Riccioli, by far the most learned of all of them, has not thought Morinus worthy of one word of mention in his list* of writers on the subject.

Riccioli cites the following additional texts. Genesis xv. 12: 'And when the sun was going down,' &c. Gen. xix. 23: 'The sun was risen upon the earth.' Gen. xxxii. 31: 'The sun rose upon him.' Judges xix. 14: 'The sun went down upon them.' Matthew v. 45: 'He maketh his sun to rise on the evil and on the good:' with several others to the same purport. Also Psalm lxxv. 3: 'The earth and all the inhabitants thereof are dissolved: I bear up the pillars of it.' He adds all the places in which 'heaven above' and 'earth beneath' are mentioned.

The Copernicans, besides the very few passages which they could find alluding to a motion of the earth (and that only an unusual one), brought forward texts in which admitted errors exist; such as the Mosaic definition of the firmament, the circumference of Solomon's brazen sea (which, the diameter being ten cubits, must have been upwards of thirty-one cubits in circumference, and not thirty, as stated), and the like. To this the general answer was, that there is a great difference between stating round numbers, according to usual measurement, and absolutely asserting untruth. Riccioli however lays it down that the obvious literal sense of the Scripture is to be taken, except where it is manifestly false; that Archimedes had shown the proportion of ten to thirty to be false, but that no one had actually shown the earth to move. This was evidently convenient, but unfair; the motion of the earth was the thing in question, and could not be proved false by assuming a literal interpretation, which, it was admitted, might be rejected if the earth's motion were true.

Upon a review of the passages cited, it is clear enough that, if there be any astronomical system at all in them, it is that of an immoveable earth and a moveable sun; while, if there be no astronomical system, it follows that vulgar notions are adopted in the modes of expression, which represent appearances without reference to their truth or falsehood. On one horn or other of this dilemma, all our modern Urbans must be content to abide: will they go back to Ptolemæus, or forward with the advance of science? Can they show any reason why the astronomical system of the Old Testament should be rejected, and those passages which appear to favour one geological theory rather than another should not only be received, but be attempted to be enforced upon others by clamours of latitudinarianism, infidelity, and all those reproaches by which (and fortunately, by which only) untolerated differences of opinion are punished?

The declining days of what was called the Aristotelian philosophy had their span much shortened by the glaring light into which it was thrown when held up against the results of the philosophy of Galileo; and this not more by the exhibition of the Ptolemaists than of their opponents the Copernicans. The latter were taught that rational mechanics must precede simple astronomy; and it is no exaggeration to say that not an inconsiderable portion of that power over nature which we now have, can be traced in its earliest growth to the necessity of finding stronger weapons to oppose the old system than were forged in the philosophical workshops of the age we have been considering.

The physical arguments of the time consisted much in supposing inclinations, propensities, and almost feelings of privilege and place, to exist in different sorts of matter. A comet says Fromond, is 'not such an obscene ape of the planets that nature should have manufactured a sphere and a heaven for it to revolve in;' and the proper pride

* Since then this is a list selected by the latest writer of note, as well as the most learned, it may be worth while to give the names.

Copernicans: Copernicus, Rheticus, Moestlinus, Kepler, Rothman (until he followed Tycho), Gilbert Foscarina, Zuniga, Bouillaud, Lansberg, Herigone, Gassendi, Des Cartes.

Anti-Copernicans: Aristotle, Ptolemæus, Theon, Regiomontanus, Alfraganus, Cleomedes, Macrobius, D'Ailly, Buchanan, Maurolico, Clavius, Baroccius, Neander, Telesius, Martinengus, Lipsius, Scheiner, Tycho, Tassonus, Claramontius, Inchofer, Fromondus, Lagalla, Tanner, Bart. Amicus, Rocco, Mersenne, Polaccus, Kircher, Spinellus, Pineda, Lorinus, Mastrius, Bellutus, Pontius, Delphinus, Elephantutius. Many of these are theologians only.

of a comet was the sufficient reason for one motion rather than another. The arguments for the sun's motion and the earth's stability may be condensed as follows. Aristotle and Ptolemæus assert it; the Scriptures assert it (Fienus puts them second); the heavenly bodies are made for man, and the servant comes to his master, not the master to the servant; the natural motion of earthly bodies (as when falling) is in a right line; a body cannot have two natural motions, therefore the earth cannot move in a circle; if the earth moved, an arrow shot upwards could not fall on the spot from whence it was shot; the air, differing from the earth in substance, cannot be moved at the same rate, consequently, mountains, towers, &c., would produce a wind if the earth moved: a stone let fall from a height would not fall directly under the point which it leaves; an arrow shot towards the east would go much farther than one shot toward the west, the first having the air with it, the second against it; houses and the earth itself, would be broken to pieces by so rapid a motion, which however the heavens can bear, being made of iron, according to Homer, while the earth is soft and friable; the immensity of the distance which must exist between the orbit of Saturn and the fixed stars, if the whole orbital motion of the earth produce no effect upon the latter; the excessive greatness of the fixed stars on the same supposition; &c., &c.

The Copernicans contended generally for the greater simplicity of their system, and the incredibility of the enormous velocity which the sphere of the fixed stars must have if the Ptolemaic hypothesis were true: to which it was answered, that God 'doeth great things past finding out, and wonders without number;' that the earth would corrupt and putrefy without motion, whereas the heavens are incorruptible: answer—that wind, &c., give sufficient motion; that the most moveable part of man is underneath, since he walks with his feet; whence the most unworthy part of the universe (which all parties called the earth) should be moveable: answer, that the Copernicans were absurd (as in fact they were) for taking the earth *out of* the centre of the universe upon an argument the force of which was derived from its being *in* the centre (or lowest part); also, which is theoretically true, that, if the earth move, the head of a man moves faster than his feet; that rest is nobler than motion, and ought therefore to belong to the sun, the nobler body: answer, that for the same reason the moon and all the planets ought to rest; that the lamp of the world ought to be in the centre: answer, that a lamp is frequently hung up from a roof to enlighten the floor; that there is a cause of motion (magnetism) in the earth: answer, that no Copernicans had examined the sun, or they might perhaps have found as good causes of motion there; that the Hebrew word for the earth has a root which signifies motion—which on the other side was contended to apply to the motion of animals upon its surface.

Such were the more common arguments of the Copernicans; others may be seen in a paper entitled 'Old Arguments against the Motion of the Earth,' in the 'Companion to the Almanac for 1836.'

If we throw away all the arguments which would now be considered fantastical, we shall find the sense of both sides of the controversy contained within very narrow limits. The strength of the Copernicans lay in the simplicity with which they exhibited the celestial motions; that of their opponents, in the then unanswerable argument of the throwing up of a stone. Both parties believed that the stone of itself would not follow the motion of the earth; at least such was the opinion until the Galilean philosophy was fully received. Fromond shows his penetration when he says that the Copernican philosophy will finally be wrecked on this argument; had he admitted an alternative, and assumed either that the mechanical argument would destroy the motion of the earth, or the motion of the earth would lead to an entire change in the principles of mechanical philosophy, no one would now have disagreed with him.

MOTTE, ANTOINE HOUDAR DE LA, was born at Paris, Jan. 17, 1672. He was educated for the law, but abandoned his profession for the drama, and in 1693, he produced 'Les Originaux,' with little success. Subsequently he produced several operas, which were very successful; and also some comedies and three or four tragedies. His 'Fables' were the best of his poetical compositions.

At the age of 40 he became blind, and lost the use of his limbs, in which condition he remained many years, and died Dec. 26, 1731.

MOTTEUX, PETER ANTHONY, was born at Rohan in Normandy, in 1660. After the revocation of the Edict of Nantes he came over to England. He kept a large East India warehouse in Leadenhall Street; and afterwards obtained a situation in the Post Office. He died Feb. 19, 1718.

Motteux published a translation of 'Don Quixote,' and wrote songs, prologues, epilogues, and four or five plays.

MOTTO, an Italian term, shortened by some of our old writers to *mot*, which means a word or sentence added to a device, and is commonly used, when put upon a scroll, as an external ornament of coat-armour. A sentence or quotation prefixed to anything written is also termed a motto.

MOULDINESS is a name applied to all minute fungi which appear in masses upon organic bodies. It appears to be caused by a damp atmosphere and a diminution of light, both which conditions are favourable to the development of those bodies whose spores or reproductive particles are floating everywhere in the atmosphere, ready to spring rapidly into growth whenever they chance to fall upon suitable situations.

All the fungi that constitute mouldiness are so small as to escape observation, except when from their numbers they form microscopical forests, and then they clothe the surface of the body which they attack with light patches of yellow, blue, white, green, red, and various other colours.

One of the most common of these fungi is the *Ascophora Mucedo*, which forms a blue mould upon bread, paste, and similar substances prepared from flour. This plant forms a fine horizontal

cobweb-like bed, from which rise up slender branches terminated by an expansion which bears the spores.

Mouldiness is occasionally produced by Coniomycetous fungi — that is, by those very imperfectly organised species which have no flocculent bed, nor any special part on which the spores are generated, but which merely consist of a series of joints within which reproductive bodies are formed. Of these, the *Torula Casei* found in the crevices of putrid cheese, may serve as an example.

The general station of these plants is upon decaying animal or vegetable matter; but one species, the *Botrytis Bassiana*, attacks the living silkworm and kills it; others destroy house-flies, which may be seen in the autumn glued by these parasites to the window, on which they have alighted in a semitorpid state.

MOULDINGS (in Architecture), any assemblage of narrow surfaces projecting from the face of a wall or other surface and advancing one beyond the other. They are bounded by straight lines, either horizontal or vertical, according to their situation, but the surfaces themselves are plane or curved, and if the latter, concave or convex, or else compounded of both forms; and again are either plain or curved.

Mouldings are distinguished by different names, according to their profiles, their sizes, or their situations. Thus the *Fillet, Tænia, Band,* are all plane or flat mouldings. The *Corona* is also a mere plain band, except that it is occasionally enriched in Roman architecture. Lesser convex mouldings are termed *Beads,* but the longer mouldings of the same kind in the bases of columns are termed *Tori* or Torusses. The *Cyma Recta,* or *Cymatium,* is a compound moulding, concave above and convex below; while the *Cyma Reversa,* is convex below and concave above. The *Cavetto* is a mere hollow or sweep intervening between and serving to connect two mouldings, one of which projects beyond the other. The *Ovolo* is a simple convex moulding, so called because it is generally carved into *Ova,* or ornaments in the shape of eggs, within hollows. All the other mouldings may be carved or enriched, except the cavetto and fillet; the pattern being accommodated to the surface of the moulding. The cyma recta, or *Talon,* as it is sometimes called, is cut with a peculiar kind of tongued or arrow-headed ornament.

In regard to Grecian mouldings, it remains to be observed that many of those which are uncarved were painted with some ornamental pattern, and not unfrequently in the most brilliant colours.

MOULINS. [Allier.]

MOULTAN. [Mooltan.]

MOULTING. [Birds.]

MOUNT SOREL. [Leicestershire.]

MOUNTAIN LIMESTONE. Mr. Smith employed this term to designate the calcareous rocks which underlie the coal strata in England. It is the equivalent of the 'Carboniferous Limestone' of Conybeare and many other English geologists.

MOUSE. [Muridæ.]

MOVEMENT, in Music, a detached and independent portion of a composition. Thus, the Pastoral Symphony of Beethoven consists of five movements, 1, a Country Scene; 2, The Rivulet; 3, The Village Dance; 4, The Storm; 5, as a *finale,* The Shepherd's Song.

MOVING FORCE may be defined as force considered with reference to the momentum it produces, in like manner as accelerating force means force considered as the cause of acceleration.

MOVING POWERS. The means employed to give motion to machinery, (independently of the cases in which the force of gravity is applied directly, as in turning the cylinder of a clock,) are the strength of men and animals, the pressure of the atmosphere, the expansive force of steam, and the action of wind or water; it is even probable that the recently proposed actions of the galvanic fluid and of fired gunpowder will in time be numbered among motive forces for impelling carriages, vessels, or machines.

The intensity of a moving power is always estimated by the amount of the resistance which is overcome and the space through which the equivalent of that resistance is conveyed, or raised vertically in a given time. Thus [Animal Strength] a man, a horse, &c., conveying a certain weight, expressed in pounds, through a certain number of miles during a working day, the continued product of the weight, the distance, and the time, denotes the intensity of the power, one pound being the unit of weight, one mile that of distance, and one hour that of time: in estimating however the power of an engine or machine it is usual to consider one foot as the unit of distance and one minute as the unit of time, one pound being the unit of weight; the action of the power is moreover supposed to be continued during all the time that the machine is at work.

Originally the larger kind of engines, except such as were impelled by wind or water, were moved by the power of horses; and when other agents were employed, the gross effect of the engine was estimated by the number of horses to whose action it was equivalent. A strong horse being able to draw 125 lbs. at the rate of 3 miles per hour during 8 hours; the product of these numbers, multiplied by the number of feet in a mile, and divided by the number of minutes in 8 hours, gives 33,000 lbs. for the weight carried or raised one foot per minute continually. This last number is the usual representation of the power of a horse.

In employing horses for the purpose of drawing on a road, it should be observed that the traces of the animal ought to be perpendicular to the collar on his breast and shoulders, so that when he leans forward, in pulling, the traces may be nearly parallel to the road; and the height of the wheels should be determined accordingly. When, in drawing a two-wheeled carriage, a horse has to overcome an obstacle on the ground, he lifts up his fore-feet, and allows his weight to act upon his hinder feet as fulcra, till the wheels have passed over the impediment. It follows that a certain portion of the loading in a cart should be

thrown on the back of the horse, in order to increase the power which the animal employs in overcoming an obstacle; and, in ordinary circumstances, it renders a considerable inclination forward unnecessary.

When a horse is employed to turn a mill, the circle which he describes should be the greatest possible, 25 or 30 feet in diameter, both to diminish the centrifugal force, and the necessity which the animal is under of reclining from a vertical position in drawing.

The force of steam-engines is estimated according to the volume of water evaporated, the pressure of the steam, the length of the stroke, &c.

Wind and water are employed as prime movers by means of the momentum arising from their velocity; and the latter, occasionally, by the pressure arising from its weight. The force of wind is made to act on sails in giving motion to vessels on the surface of water, and also in producing the revolutions of windmill sails. With respect to the power of an oar in giving motion to a vessel, it must evidently be proportional to the area of the blade of the oar under water, and to the square of the difference between the velocities of the oar and vessel, the former velocity being determined by the path, parallel to the keel, of the centre of percussion in the oar during a complete stroke. The power of the oar in rowing appears to be diminished by the reaction of the feet of the rowers in pressing against the foot-boards; this has a tendency to force the vessel backwards, but it is compensated by the greater velocity which the centre of percussion in the oar thereby acquires.

The velocity of a vessel impelled by steam, in which paddle-wheels are employed, might easily be found if it were possible to determine, nearly, the number of square feet of paddle which, on both sides of the vessel, are at every moment acting efficiently against the water: the velocity of the wheel would be, of course, determined by the number of revolutions which the wheel makes in a given time; and it should be expressed by the number of feet per second which the centre of percussion in the paddle moves through in turning about the axle.

The momentum of water flowing horizontally against a plane, such as a float board of an undershot wheel, depends on its velocity, on the area of the surface with which it comes in contact, and on the obliquity of that surface to the direction of its motion; and, in estimating the effect of water on such a wheel, it is necessary to determine from the dimensions of the channel and the velocity of the water in it the weight of water which descends vertically through a certain height, as one foot, in a given time. The product of this weight multiplied by the height actually descended, being compared with the product of the number of pounds which the wheel can raise to a certain height in the same time multiplied by that height, expresses the ratio of the power to the effect.

The power of an overshot wheel is estimated by the product of the weight of water expended in a given time, multiplied by the whole height of its descent, that is, by the sum of the diameter of the wheel and the height of water in the reservoir above the top of the wheel. The useful effect of an overshot wheel is said to be nearly double that of one which is undershot.

The power of a breast-wheel is conceived to be equivalent to that of an undershot wheel whose head of water is equal to the difference in height between the surface of the water in the reservoir and the point at which the water impinges on the wheel, together with the effect of an overshot wheel whose height is equal to the difference between the point of impact and the level of the tail-water.

MOXA, a word of uncertain origin, signifying any substance whose gradual combustion on or near the skin is used for the relief or cure of disease. This method was early practised in the East, particularly by the Chinese and Japanese, from whom it was copied by the Portuguese; but having fallen into disuse, it was revived by the French surgeons during the Egyptian campaign. The substance employed by the Chinese is formed of the downy covering of the leaves of the *Artemisia Moxa* (De Candolle); but the down of many other plants, or the pith, may be used. The stalk containing the pith of the common Sun-Flower (*Helianthus annuus*) is a very convenient means, when the prepared moxas cannot be procured. Those used in Britain are all imported from France, and generally consist either of a pyramidal or cylindrical roll of linen, which is mostly steeped in a solution of nitrate or chlorate of potass. It is ignited at the one end, and the combustion gradually extends to the other. The effects of the moxa are less severe than the actual cautery, and more powerful than blisters. The cases in which moxa has been recommended, where other counter-irritants have failed, are those of neuralgia and paralysis.

MOZAMBIQUE, COAST AND CHANNEL. The Mozambique Coast is that portion of the eastern coast of Africa which is situated between Cape Delgado (10° 41′ S. lat., and 40° 34′ E. long.) on the north, and the northern mouth of the river Zambesi (17° 30′ S. lat., and 33° E. long.) on the south, constituting the western side of the wide strait by which the island of Madagascar is separated from the mainland of Africa, and which is called the Channel of Mozambique.

Though this country lies along a sea frequently navigated by vessels sailing to the East Indies, and though the Portuguese have had settlements on it for more than three centuries, the country is very little known. The Portuguese have a few forts along the coast. The interior contains a good deal of morass, and is infested by wild beasts. The coast is lined by shoals and by small coral islands, of which one or two are inhabited.

The *Mozambique Channel* is 250 miles wide in the narrowest part. Its length, between 12° and 25° 45′ S. lat., may be about a thousand miles. Towards its northern extremity are the Comoro Islands. Along the Madagascar shore there are several rocky islands, and a few small islands occur in the middle of the channel. The shores of Madagascar are tolerably high, but those of

the coast of Mozambique are all low. The depth of water is very considerable.

MOZAMBIQUE, a town, which is the principal settlement of the Portuguese on the eastern coast of Africa. It is situated in 15° 2′ S. lat., and 40° 43′ E. long., on one of three islands which face a deep inlet of the sea, forming an excellent harbour. The other two islands, San George and San Iago, are uninhabited.

The island of Mozambique has three tolerable forts. The streets of the city are narrow, but the houses are generally lofty and well constructed. Nearly in the middle of the city is a large square, having on its four sides the palace of the governor, the custom-house, the main-guard, and a commodious stone wharf. The city takes up one half of the island, and to the south of it is the Black Town, inhabited by coloured people.

The population, amounting to about 6000, consists of a small number of Portuguese, and a larger number of Canareens, an appellation given to the Creole Portuguese of Goa and the other Portuguese settlements in the East Indies. There is also a considerable number of Banyans from Hindustan, but the free coloured people and the slaves constitute the bulk of the population. The commerce of Mozambique has greatly decreased.

Mozambique was first visited by Vasco de Gama in 1498. The town was taken in 1506 by Tristan d'Acuña and Albuquerque, and Mozambique became the centre of the Portuguese possessions in those seas, and the seat of a viceroy, to whom all other governors in Africa were subordinate.

MOZART, JOHANN-CHRYSO'STOMUS-WOLFGANG-AMADEUS, was born at Salzburg, Jan. 27, 1756. His father was subdirector of the chapel of the prince-archbishop of Salzburg. When little more than an infant the young Mozart showed himself remarkably sensitive to music, and when only four years old his father taught him a few easy minuets and simple lessons on the harpsichord. In less than two years more appeared the first dawn of his talent for composition; he invented short pieces of music, which his father noted down. In all his pursuits his ardour was extraordinary.

Not long after he had completed his sixth year, the child excited the astonishment of his father by the production of a harpsichord concerto, methodically and correctly written. This determined the father to let the youthful prodigy be seen at some of the German courts. He first took him to Munich, where the elector of Bavaria received him with every kind of encouragement. In 1762 the party proceeded to Vienna, and performed before the emperor Francis I. In the following year the Mozart family made an extensive European tour. In Paris Mozart published his first two works, when he had not finished his eighth year.

In 1764 the Mozarts arrived in London, and remained till the summer of 1765. During this residence in our metropolis, he composed and published six sonatas, which he was permitted to dedicate to the queen of Great Britain. The family then returned to the Continent. At the Hague Mozart published six more sonatas. The party returned to Salzburg in 1768. In the same year Mozart composed an opera, 'La Finta Semplice;' but it never was publicly performed.

In 1769 Mozart was appointed director of the archbishop of Salzburg's concerts. Soon after he went with his father to Italy, and at Bologna, Rome, and Naples, excited the highest admiration by his performances on the harpsichord and his rapidity of composition. At Milan, in 1770, he brought out his second opera, 'Mitridate.' In 1773 appeared his 'Lucio Silla.' In the same year he produced an opera buffa, 'La Finta Giardiniera,' two Masses for the chapel of the elector of Bavaria, &c. In 1775, he composed the cantata 'Il Re Pastore.'

In 1779 Mozart settled at Vienna, and here he met Madlle. Constance Weber, to whom he made an offer of marriage, but was refused by her family on the ground of the insecurity of his means; whereupon he wrote his 'Idomeneus,' which had great success, and in which Madlle. Weber performed: this success obtained for him the lady's hand. In 1782 he produced 'Die Entführung aus dem Serail.' 'Le Nozze di Figaro' was produced in 1786. In the same year was brought out his 'Schauspiel Direktor.' In 1787 appeared at Prague the chef-d'œuvre of Mozart, 'Don Giovanni.' The comic opera 'Cosi fan Tutte' was composed in 1790; 'Die Zauberflöte' in 1791; and 'La Clemenza di Tito' in the same year.

Of Mozart's symphonies, quintets, quartets, sonatas, &c.,—of his masses, motets, detached vocal pieces, and many other works—we cannot afford space for even a bare list. The last, and, taken as a whole, the most sublime work of Mozart, his 'Requiem,' was written on his deathbed. He died at Vienna, Dec. 5, 1792. He left a widow and two sons.

MU'CUNA, a genus of plants belonging to the natural order *Leguminosæ*. The species are climbing herbs or shrubs, with pinnately trifoliate leaves and axillary racemes, which hang down when bearing fruit. *M. prurita*, Cowitch, has pods covered all over with a thick coating of erect, white, stinging hairs, which turn black in drying, and brown when ripe. It is a native of the hedges and banks of the East Indies. *M. pruriens*, Common or Stinging Cowitch, likewise has pods about three inches long, the thickness of the finger, closely covered with strong brown stinging hairs. A mixture of the hairs of these two species form the Cowitch of commerce. The ripe pods are dipped in syrup, which is scraped off with a knife, and when the syrup has attained the thickness of honey, by means of the hairs becoming mixed with it, it is used as a medicine, and is considered a good anthelmintic, as it occasions no uneasiness. The hairs, when applied to the skin, produce an intolerable and painful itching.

MUCUS, the fluid substance on the surface of mucous membranes. By the contact of the foreign matters to which all the mucous membranes are exposed in the performance of their functions, or by other processes, the epithelium cells which

cover their surface are constantly being removed, and their place is as constantly supplied by the formation of new cells from the surface beneath. Thus on all the mucous surfaces a more or less rapid process of desquamation and reproduction of cuticle is ever going on; the superficial layers scaling off, and deep layers being produced in a manner exactly similar to that in which, as the outer surface of the cuticle of the skin (the epidermis) is removed, fresh layers are deposited on the inner surface to replace them and maintain the thickness of the membrane.

The superficial layer of epithelium cells thus removed, not in dry scales, like the epidermis, but mixed with a quantity of watery fluid secreted by the surface of the mucous membrane, constitutes healthy mucus—a viscid, ropy, transparent, and apparently homogeneous substance, which is distinguished more especially by the presence of minute epithelium cells either floating separately or united into small membranous flocculi. Its chief chemical properties are that it mixes with any quantity of water without being dissolved, but, swelling up and forming flocculi, does not dissolve in alcohol, and is not coagulated by heat. It is subject to various alterations by disease.

MUDAR. [Calotropis.]

MUEZZIN, in Mohammedan countries, is the general appellation of those officers of the mosques whose duty it is to cry out from the minaret gallery the invitation to prayers, at the five canonical hours, namely, at dawn, at noon, at four o'clock in the afternoon, at sunset, and at night-close. The muezzin cry is a substitute for bells, which are not used in Mohammedan countries. On hearing the muezzin's call, the devout Mussulmans turn their faces towards Mecca, and recite their prayers.

MUFFLE, a vaulted flat-bottomed earthen vessel in which substances may be strongly heated, and at the same time protected from the contact of the fuel. In the muffle smaller vessels are placed containing the substances to be acted upon.

MUFTI, the general denomination of the head doctors of the law in Turkey, of whom there is one in every large town. The mufti of Constantinople is the highest in rank, and has a jurisdiction over the muftis of the provinces. He is styled Sheikh ul Islam, or 'chief of the elect,' and is consulted in important matters of law. His dress is of white ermine.

MUGGLETONIANS, a sect of Christians which arose in England in the year 1651. The leaders were Lodowicke Muggleton, a journeyman tailor, and John Reeve, who asserted that they had been appointed by a voice from God as the last and greatest prophets of Jesus Christ. They published a great number of works, and obtained many followers. The chief writers against them were the Quakers, and among these, George Fox and William Penn. On January 17, 1676, Muggleton was convicted of blasphemy. He died March 14, 1697, at the age of 88.

The chief articles of their creed appear to have been, that God has the real body of a man, that the Trinity is only a variety of names of God, that God himself came down to earth, and was born as a man and suffered death, and that during this time Elias was his representative in heaven. According to them the soul of man is inseparably united with the body, with which it dies and will rise again.

A complete collection of the works of Reeve and Muggleton, together with other Muggletonian tracts, was published by some of their modern followers, in 3 vols. 4to., 1832.

MUGI'LIDÆ, a family of fishes of the order *Acanthopterygii*, containing two British genera, viz. *Mugil* and *Atherina*. To the former genus belong the Grey Mullett (*Mugil Capito*, Cuv.); the Thick-Lipped Grey Mullet (*M. Chelo*, Cuv.); and the Short Grey Mullet (*M. curtus*, Yarrell). The latter genus contains the Atherine or Sand-Smelt (*Atherina Presbyter*, Cuv.), common on the coasts of Hampshire and Devonshire. It must not be confounded with the true Smelt. The Red Mullets (genus *Mullus*) belong to the Perch family, or *Percidæ*. (Yarrell's *British Fishes*.)

MÜHLHEIM. [Düsseldorf.]

MÜHLHAUSEN, a large manufacturing town in the French department of Haut-Rhin, which, with the communes of Illzach and Modenteim, though entirely surrounded by France, was a member of the Swiss Confederation till 1793, when it voted its annexation to France, with which it was incorporated by treaty in 1798. The town is situated on the Ill, a feeder of the Rhine, in 47° 45′ N. lat., 7° 21′ E. long., at a distance by railway of 27 miles S. from Colmar, 18 N.W. from Basel, and has a tribunal of commerce, a bank, a council of Prud'Hommes, a college, and 20,587 inhabitants. Mühlhausen is built on an island formed by the Ill, which is here crossed by several bridges. The town forms an irregular oval; the streets are tolerably broad and well paved, and the houses well built. There are a Catholic and a Protestant church, a town-hall, a synagogue, an hospital, several squares, and a college. Mühlhausen has obtained deserved celebrity for its printed cottons, for the manufacture of which there are several important establishments. The other manufactures are cotton and woollen yarn, muslin, silk, woollen cloth, hosiery, straw hats, morocco leather, soap, damask, linen thread, &c. There are dye-houses, tan-yards, metal-foundries, and large establishments for making steam machinery. There is also a considerable commerce in corn, wine, brandy, groceries, hardware, iron, &c. The canal which unites the Rhône to the Rhine, passes by the town. A railroad, 13 miles in length, runs westward from Mühlhausen to the busy little manufacturing town of Thann.

MÜHLHAUSEN. [Erfurt.]

MUKRAN. [Beloochistan.]

MULBERRY. The black or common mulberry is the fruit of *Morus nigra*, the only species of Morus worthy of being cultivated as a fruit-tree. It is a native of Persia, and its indigenous range appears to be extensive. Its introduction to this country dates about the middle of the 16th century. Under great vicissitudes it proves very tenacious of life; and under ordinary circumstances

it attains, even in this climate, a considerable age, for some trees planted in 1548 are still alive.

As the acquisition of a good mulberry-tree is very desirable, the following directions for obtaining a bearing tree readily and quickly will be useful. If a tolerably large branch of a vigorous tree be 'ringed,' and the annulation be inclosed in a box filled with rich soil, sufficiently large to hold as much as will preserve a somewhat uniform temperature, or at least an approximation to that which the roots of a tree naturally experience in the ground, roots will be readily emitted into the earth, and in due time the branch may be cut off and planted. A covering of moss is useful, partly for maintaining an equable temperature, and partly for preserving moisture.

The mulberry-tree requires very little pruning beyond that of regulating the head. The season for this operation should be always mid-winter; for, if in a growing state, this plant bears amputation very ill, especially as regards large limbs.

The fruit (popularly, but incorrectly, termed a berry) of *Morus nigra* is used in medicine. It contains much mucilage, with an astringent resin, and is sweetish and subacid, owing to the presence of some malic or tartaric acid. As the cooling properties depend on the acid, the fruit should be gathered before it is quite ripe. It may either be formed into a syrup, or a vinegar may be made with it similar to raspberry vinegar, which constitutes an excellent gargle in inflammatory sore-throat, and a drink in slight febrile affections.

MULCASTER, RICHARD, was a native of Carlisle. He was educated at Eton and at Cambridge, whence removing to Oxford he was chosen student of Christ Church in 1555. He was distinguished for his attainments in oriental literature and in philosophy. In 1561 he was appointed first master of Merchant Taylors' School, and held the situation till 1586, when he resigned, and afterwards became under-master of St. Paul's School. He died at his rectory of Stamford Rivers, in Essex, on Aug. 15, 1611. His principal works are—'Positions;' 'The first part of the Elementarie, which entreateth chefely of the right writing of the English Tung;' 'Catechismus Paulinus, in usum Scholæ Paulinæ conscriptus, ad formam parvi illius Anglici Catechismi qui pueris in communi Præcum Anglicarum libro ediscendus proponitur,' 8vo., 1601.

MULE. This word is, in its particular sense, used to denote the offspring of the male ass and the mare; but, in its general signification, it is applied to the offspring of any two animals of distinct species, and is then synonymous with the term Hybrid. [Hybrid; Horse.]

That hybrids will frequently interbreed with an individual of one of the pure unmixed stocks from which they sprung, is a fact which cannot be contested. From this circumstance John Hunter was inclined to the opinion that the identity of two supposed distinct species is thereby proved: for example, that the wolf, jackal, and dog, are all of the same species; but this cannot be admitted; for, as Professor Owen well observes, 'to prove the identity of two supposed distinct species, granting the fertility of the hybrids from the two to be the proof required, it should be shown that such hybrids are fertile *inter se*, and capable of propagating indefinitely an intermediate variety. Now this is precisely the fact which is wanting in the evidence adduced. All that Hunter proves is that two species, very nearly allied to each other, will produce a hybrid offspring, and that the hybrid is again productive with an individual of the pure breed. There is between distinct species an aversion to sexual union, more or less strong; but this aversion is often softened down by a concurrence of influencing causes, which conduce to erratic alliances. Thus the lion and tigress have produced hybrids, and the caged canary-bird will pair with the goldfinch, linnet, &c. [Canary-Bird.] Occasionally distinct species in a state of nature, especially when nearly allied, form unions together.

Thus there are several instances on record of the Hooded Crow (*Corvus Cornix*) pairing and producing offspring with the Carrion Crow (*Corvus Corone*). Mr. Berry notices the pairing of a Blackbird and a Thrush in Lancashire: these birds reared their broods, which were strongly marked hybrids, for two successive years. ('Magazine of Nat. Hist.,' vol. vii.) Mr. Yarrell, in his 'History of British Birds,' states that several instances are known in which the female of the Black Grouse, usually called the Grey Hen, has bred in a wild state with the Common Pheasant. Such a hybrid is represented in the title-page of Mr. T. C. Eyton's 'History of the Rarer British Birds.' The last-named ornithologist has also recorded the fruitful connection between the Common Goose and the Chinese Gander; and the Hon. Twiselton Fiennes communicated to the Zoological Society of London an instance of the Common Wild Duck breeding with the male Pintail.

MULE-JENNY. [Cotton-Spinning.]

MULGE'DIUM, a genus of plants belonging to the natural order *Compositæ*, the suborder *Ligulifloræ*, the tribe *Cichoraceæ*, and subtribe *Hieraceæ*. There are several species of this genus. *M. alpinum* has blue flowers in small numerous heads, with a stem about 3 feet high. It is a remarkably handsome plant, and is the only British species of the genus.

MULINA'RI, or MOLINA'RI, STE'FANO, was born at Florence towards the middle of the 18th century, and was the pupil of A. Scacciati, whom he assisted in a series of engravings after drawings in the Florentine Collection, fifty-nine of which were executed entirely by Mulinari. These were succeeded, in 1775, by a collection of prints after drawings of the earliest masters, from Cimabue to Pietro Perugino, which was followed, in 1780, by 'Saggio delle Cinque Scuole di Pittura Italiana.' Mulinari died near the close of the 18th century, aged about 55.

MULL, an island on the western coast of Scotland, which is included in Argyllshire, and is comprised between 56° 16′ and 56° 40′ N. lat., and 5° 45′ and 6° 23′ W. long. Its length from north to south is 30 miles, and the greatest width E. to W. is 23 miles. It is separated on the N. E. from the mainland by a narrow strait called

the Sound of Mull. The coast is indented by numerous lochs and bays. The substance of the island is principally trap rock. The highest mountain, called Benmore, is 3168 feet in height.

The interior of Mull is trackless, repulsive, and dreary. The soil, where the surface is not covered with crags, heath, or swampy morasses, consists of loam and clay. Oats, barley, and potatoes are cultivated. The breeding of sheep and black cattle is the principal object of the farmer.

The principal town or village is Tobermorey, on the north-eastern point of the island. It has a harbour, pier, and custom-house, at which all the forms connected with the herring-fishery have to be gone through.

MÜLLER, OTHO FRIDERIC, a Danish naturalist, was born at Copenhagen, March 11, 1730. He devoted himself early to the study of natural history, and in 1763 he published a work on fungi, in Danish, which was followed by 'Fauna Insectorum Friedrichsdaliana;' and 'Flora Friedrichsdaliana.' He was appointed to continue the publication of the 'Flora' of Denmark, a superb work, undertaken by the command of king Frederic V. Müller next turned to the study of minute animals, and he published in 1771 a work on 'Certain Worms inhabiting Fresh and Salt Water:' and afterwards 'Vermium Terrestrium et Fluviatilium, seu Animalium Infusoriorum, Helminthicorum, et Testaceorum non Marinorum, Succincta Historia.' His treatises on the 'Hydrachnæ in Aquis Daniæ Palustribus detectæ et descriptæ,' and on the 'Entomostraca,' are monuments of patient investigation. He also prepared a work on the Infusoria, which after his death (Dec. 26, 1784) was published in 1786, and gained the praise of Cuvier.

In 1779 Müller commenced the magnificent 'Zoologia Danica.' He only lived to publish two parts, each containing 40 coloured plates. Müller wrote a general catalogue of the animals of Denmark, entitled 'Zoologiæ Danicæ Prodromus,' 8vo., Copenhagen, 1777, and several memoirs on different subjects.

MÜLLER, JOHANN GOTTHARD VON, was born at Bernhausen, near Stuttgart, in 1747. He pursued the art of engraving for six years (1770–1776), at Paris, under Wille, with such success that, in 1776, he was elected a member of the French Academy. He was recalled in the same year by Carl, Duke of Würtemberg, to Stuttgart. His last work in Paris was a good portrait of his master, J. G. Wille. In 1785 he was invited to Paris to engrave the portrait of Louis XVI., painted in 1774 by Duplessis. In 1802 Müller was made professor of engraving in the academy at Stuttgart. He was elected successively a member of the principal German academies; was presented in 1808, by King Frederick of Würtemberg, with the Order of Civil Merit; and in 1818 was made a Knight of the Würtemberg Crown by Frederick's successor William. He died at Stuttgart in 1830.

MÜLLER, JOHANN, was born at Schaffhausen, in Switzerland, in 1752. He studied at Göttingen, under Heyne, Schlœzer, Walch, and other eminent professors, and showed an early taste for historical research. In 1781 Müller was appointed professor of history at Cassel, where he published a treatise 'On the Influence of the Ancients upon the Moderns,' and another on the establishment of the temporal dominion of the popes in the eighth century. About the same time he published the first volume of his 'Geschichte der Schweizerischer Eidgenossenschaft.' After the battle of Jena in 1806, Napoleon saw Müller at Berlin, and showed him a marked regard. In 1807 Napoleon appointed him secretary of state to the new kingdom of Westphalia; an office which he exchanged in the following year for that of director of public instruction. He died at Cassel, in May, 1809. His complete works were published at Tübingen in 27 vols., 1810-19.

MÜLLER, CHRISTIAN FRIEDRICH VON, son of Johann Gotthard, was born at Stuttgart in 1783, and died at Pirna, near Dresden, in 1816, aged only 33. He engraved only eighteen plates, but the Madonna di San Sisto (his last and greatest work) exhibits him at least the equal, if not the superior, of Raphael Morghen, to whose Transfiguration it serves as a good pendant: there are several lithographic copies of it. His other works are nearly all portraits: among them are—Jerome Bonaparte, Schiller, Jacobi the poet, Professor Hebel, Dr. Hufeland, William, king of Würtemberg, as Crown Prince, and a medallion of Napoleon.

MÜLLER, WILHELM, was born at Dessau, Oct. 7, 1794. He produced his 'Blumenlese aus den Minnesänger,' in 1816. He next translated Marlowe's 'Faustus,' and in 1818 brought out 'Rom, Römer, and Römerinnen.' His literary reputation was greatly increased by his 'Gedichte aus den hinterlassenen Papieren eines reisenden Waldhornisten,' and his 'Lieder der Griechen.' He died October 1, 1827.

MÜLLER, CARL OTTFRIED, one of the most learned scholars of modern times, was born in 1797, at Brieg, in Silesia. He received his early education in the gymnasium of Brieg, and in 1813 he entered the university of Breslau, where he devoted himself to philology. From 1815 to 1817 he studied at Berlin. In 1819 Müller was invited to a professorship in the university of Göttingen. His activity created a new æra in the history of Göttingen, and under his and Dissen's auspices the study of philology and ancient literature received an impulse which was felt over all Germany. In order to acquire a more intimate knowledge of ancient works of art he spent in 1819 some time at Dresden, and in 1822 he visited France and England. But although his attention was more particularly directed to ancient art, he never lost sight of the fact that the arts of the ancients represented only one side of their intellectual activity, and formed only one source among the many from which a complete knowledge of antiquity is to be derived. Müller's principal works are 'Die Dorier,' or the Dorians, which has been translated into English by H. Tuffnell and G. C. Lewis; the second

edition of the translation appeared in 1840: 'Die Etrusker,' or the Etruscans: a 'Manual of the History of Ancient Art': and a 'History of Greek Literature,' published in English, but not completed. The only correct edition of Festus that we have is that of Müller (Leipzig, 1839, 4to.), and his edition of Varro's work 'De Lingua Latina' (Leipzig, 1833, 8vo.), and of the 'Eumenides' of Æschylus, are equally valuable. In 1839 Müller resolved to visit Italy and Greece. His activity in Greece was very great. One hot day in July, 1840, while engaged in making some excavations at Delphi, he was seized with a fever, in consequence of which he died soon after he had returned to Athens, Aug. 1, 1840. He was buried in the Ancient Academy at Athens.

MÜLLER, WILLIAM JOHN, a landscape and costume painter, was born of a German father at Bristol, in 1812. Müller's first instructor in art was the landscape painter J. B. Pyne. In 1833 and 1834 he made a tour in Germany, Switzerland, and Italy, and made many admirable sketches. In 1838 he started upon a long and arduous tour through Greece and Egypt, and returned to London towards the close of 1839, and for the Royal Academy exhibition of 1840, he produced two pictures of great merit—Athens from the Road to Marathon, and the Memnon, or Ruins at Gornou in Egypt at Sunset. The former, for which Müller received only 30 guineas, was afterwards purchased by a picture dealer for nearly ten times the amount.

In 1843 Müller joined Sir Charles Fellowes on his expedition to Lycia, to remove to London the Xanthian Marbles, now in the British Museum. He returned to London in 1844, and sent five pictures to the Royal Academy exhibition of 1845, which were, with one exception, hung to great disadvantage. He also exhibited several pictures at the British Institution, among which were, in 1845, a View of Rhodes with the Pasha's Palace, and a Dance at Xanthus. Müller was seized with a severe illness in the month of May, which ended fatally at Bristol, Sept. 8, 1845.

MULLINGAR. [MEATH, WEST.]

MULLION, a term in Gothic Architecture applied to the upright bars, or rather stone shafts, dividing the general aperture of a window into secondary openings, which are again frequently subdivided vertically by a similar shaft crossing the mullions horizontally, and therefore called a *Transom;* whereby the whole space beneath the head of a window (supposing it to be an arched one) is formed into a series of pannels in which the glass is fixed, and which are sometimes technically distinguished as *lights*. For instance, the façade of York Cathedral is divided into eight lights or compartments by seven mullions, while that above the entrance to Westminster Hall has eight mullions.

MULTIPLE, SUBMULTIPLE, MULTIPLICATION. Any number of *equal* magnitudes added together give a multiple of any one among them. Thus 4 + 4 + 4, or 12, is a multiple of 4. And submultiple is the inverse term to multiple: thus 12 being a multiple of 4, 4 is a *submultiple* of 12. The term Submultiple is equivalent to *Aliquot Part*.

If we look at the primary rules of arithmetic, we shall see that multiplication is the only one which cannot be entirely performed upon concrete quantities. To or from 100 yards 50 yards can be added or subtracted, and 100 yards can be divided by 50 yards; but 100 yards cannot be multiplied by 50 yards. The very definition of multiplication requires that every question should contain a number of *times* which another number, abstract or concrete, is to be repeated; and this number of times or repetitions cannot be a number of anything else. Thus to talk of multiplying 10 feet by 7 feet is a contradiction in terms; if it mean that 10 feet is to be multiplied by 7, or that 7 repetitions of 10 feet are to be made, 10 feet is multiplied *seven* times, not *seven-feet* times. But if it be meant that 10 feet is to be repeated as often as 7 feet contains *one* foot, the question has three data, and is in fact a question of multiplication in which the number of repetitions is not given, but is to be extracted from the result of a question in division.

The abbreviated process of multiplication rests upon the following principles. (1.) If the parts of a number be multiplied, and the results added together, the whole is multiplied: thus 18, composed of 13 and 5, is taken 7 times by taking 13 and 5 each 7 times, and adding the results. (2.) Multiplication by the parts of any number, and addition of the results, is equivalent to multiplication by the whole: thus 13 taken 7 times and 8 times gives two products, the sum of which is 13 taken 7 + 8 or 15 times. (3.) Successive multiplication by two numbers is equivalent to one multiplication by the product of these two numbers: thus 7 taken 3 times, and the result taken 4 times, is 7 taken as many times as there are units in 4 times 3, or 12 times. (4.) If one number be multiplied by another, the result is the same if the multiplicand and multiplier be changed: thus 7 times 8 is the same thing as 8 times 7. (5.) In the decimal system, the annexing of one cipher multiplies by 10, of two ciphers by 100, &c.

The application of these principles requires that, in the decimal system of notation, the products of all simple digits up to 9 times 9 should be remembered: this is usually done by learning what is called the multiplication table, and this table, which is only absolutely necessary up to 9 times 9, is usually committed to memory up to 12 times 12.

The multiplication of sums of money is facilitated by a process known by the name of *Practice*.

The multiplication of fractions offers no difficulty when the extension of the word multiplication, already described, is understood and admitted. For instance, when we have to multiply $\frac{2}{3}$ by $\frac{4}{11}$, or to take $\frac{2}{3}$ 4-elevenths of a time, we see that $\frac{2}{3}$ being $\frac{22}{33}$, one-eleventh of this is $\frac{2}{33}$, and 4-elevenths is $\frac{8}{33}$: whence the rule commonly given, namely, multiply the numerators together for a numerator, and the denominators for a denominator. In the multiplication of one decimal fraction by another, as 1.23 by .018, the multi-

plication of the numerators gives 123 × 18, or 2214, and that of the denominators 100 × 1000, or 100,000. But a decimal fraction which has 100,000 for its denominator, has as many places as there are in both of the others together, whose denominators are 100 and 1000. From this consideration the common rule immediately follows.

MULTIPLE POINTS. When two or more branches of a curve pass through the same point, it is called a multiple point; and this, whether the branches touch or cut one another. (De Morgan's *Differential Calculus.*)

MULTIPLICATION. [MULTIPLE, &c.]

MULTIVALVES, the name formerly used to designate those shells which were made up of more than two pieces. Thus the *Cirrhipeds* (*Lepas*) were all multivalve shells of Linnæus.

MUMMY is a name derived from an Arabic word *mum*, signifying wax, and which is now applied not only to those dead bodies of men and animals, in the preparation of which wax or some similar material was used, but to all those which are by any means preserved in a dry state from the process of putrefaction.

The art of embalming, by which the greater part of the mummies now existing were prepared, was practised, with more skill than has ever since been acquired, by the inhabitants of ancient Egypt, of whom whole generations still remain preserved from decay in the vast hypogæa or catacombs in the neighbourhood of Thebes and the other great cities of that country.

The most authentic description of the Egyptian method of embalming is that given by Herodotus (ii. 86). In Egypt, he tells us, 'there are men who professedly exercise this art. When a corpse is brought to them, they show the bearers of it wooden models of bodies, painted in imitation of reality. They say that the most expensive of them is His whose name I will not in such a case mention. They exhibit also a second model, inferior to the first, and cheaper than it; and a third, the cheapest of all. After this explanation, they ask the bearers of the dead body, after which model they wish it to be prepared, and they, having agreed upon the price, depart. The embalmers proceed for the most expensive plan in the following manner. First, with a curved iron they extract the brain through the nostrils, partly by pulling it out, and partly by pouring drugs in. Then with a sharp Æthiopian stone they cut the body in the flank, and through this aperture they take out all the viscera, which they wash with palm wine, and clean with powdered aromatics. They then fill the belly with the purest powdered myrrh and cassia, and other perfumes (frankincense excepted), and sew up the wound. In the next place they cover the body with natrum [a mixture of carbonate, sulphate, and muriate of soda], and bury it in the same material for seventy days, a longer period not being allowed. When the seventy days are passed, they wash the body and envelop it all in bandages of fine linen covered with gum. The relatives, on receiving the body again, have a wooden case made in the form of a man, in which they place it, and having shut it in, they put it in a sepulchral building, setting it upright against the wall. Those who would avoid the heavy expense of this method of embalming, have the bodies thus prepared:—They fill all the intestines with cedar oil, without either cutting into the abdomen or removing the viscera; then preventing the egress of the injected fluid, they salt the body for the fixed number of days, and at the end of that time they let out the cedar oil, the power of which is such that it brings out macerated in it both the intestines and all the viscera; it consumes the flesh, and the skin and the bones only of the corpse remain. This being done, they return the body. The third mode of preparation is that with which the bodies of the poor are treated. They wash out the abdomen with a cleansing liquid, put it for seventy days in natrum, and then return it to the relatives.' To this description of the preparation of mummies by Herodotus modern observers have added little of importance, whilst they have confirmed him in almost every particular.

The bandaging, to which all the Egyptian mummies were subjected, was one of the most remarkable parts of the process. Their envelopes are composed of numerous linen bands, each several feet long, applied one over the other fifteen or twenty times, and surrounding first each limb, and then the whole body. They are applied and interlaced so accurately, that one might suppose they were intended to restore to the dry shrivelled body its original form and size. The only difference in the bandages of the different kinds of mummies is in their greater or less fineness of texture; they are applied on all in nearly the same manner. All the bandages and wrappings which have been examined with the miscroscope are of linen.

The Egyptians practised embalming almost as extensively on some animals which they deemed sacred as on men. The list of the mummies of animals includes beasts, birds, fish, reptiles, and even insects. Most of these animals had sepulchres appropriated to their species, but sometimes they are mixed, and very rarely they are found in the catacombs of human mummies.

The Egyptian mode of embalming was imitated occasionally by the Jews, Greeks, Romans, and other nations, and has sometimes been adopted in modern times, but never to the same extent or perfection as they attained.

In some situations the conditions of the soil and atmosphere, by the rapidity with which they permit the drying of the animal tissues to be effected, are alone sufficient for the preservation of the body in the form of a mummy. This is the case in some parts of Peru, in the sandy deserts of Africa, and even in vaults in Great Britain, in peculiar soils, in which the bodies undergo a slow process of drying, and then remain almost unalterable even on exposure to the air and moisture.

MUMPS, an inflammation of the parotid gland, and often at the same time of the other salivary glands, of contagious or epidemic origin. The inflammation, and the fever by which it is accompanied, generally increase for about four days, and then begin to subside; and after four days more, the disease is commonly at an end. The affection has a tendency to pass suddenly from the

organ first affected to some other. The treatment required is very simple; quietude, abstinence, seclusion from cold, the application of poultices or other warm substances, or, in severe cases, of leeches, to the swelling, are all the means that are usually necessary.

MUN, THOMAS, an English writer on political economy, who lived in the earlier part of the 17th century. His best known work, a small octavo volume, published at London in 1664, is entitled 'England's Treasure by Foreign Trade; or, the Balance of our Foreign Trade is the Rule of our Treasure. Written by Thomas Mun, of London, Merchant, and now published for the common good by his son John Mun of Bearsted, in the county of Kent, Esquire.' This title-page comprehends nearly all the particulars we have been able to discover respecting Mun. He has been understood also to be the writer of a work entitled 'A Discourse of Trade from England to the East Indies, by T. M.,' 4to. London, 1621.

The object of this last-mentioned work is to defend the East India trade from the charge brought against it of exhausting the national wealth by occasioning an annual exportation of treasure, or of gold and silver.

MÜNCHHAUSEN, ADOLPHUS, BARON, born in Hanover in 1688, studied at Jena, Halle, and Utrecht, and afterwards filled several important official stations in the electorate. He was an active agent in founding the university of Göttingen, in which he established chairs of geography, literary history, and political science. He promoted the establishment of the Royal Society of Sciences of Göttingen. He increased the library of the university from 10,000 to 60,000 volumes. More ample particulars of what Münchhausen effected for the benefit of the university of Göttingen are given in the 'Quarterly Journal of Education,' No. XX.; in Heyne's 'Oratio in Honorem ac Memoriam Münchhausianam.'

Münchhausen was privy-councillor of Hanover to George II. of Great Britain, and first minister of his successor. He died at Hanover, in 1770.

MUNDAY, ANTHONY, must, according to his epitaph, have been born in 1553. His early life is almost totally unknown; but he was at one time abroad, and describes himself as having been 'the Pope's scholar in the seminary at Rome.' In 1582 he was one of the instruments in the detection of the Popish conspiracy; and he published 'A breefe and true Reporte of the Execution of certain Traytours at Tiborne the 28th and 30th days of May, 1582; gathered by A. M., who was there present.' This pamphlet was not Munday's first publication. His tract called 'The Mirror of Mutabilitie' had appeared in 1579; and he published, after this date, a large number of pieces in prose and verse, originals and translations. Lists will be found in the 'British Bibliographer' and elsewhere. Mr. Collier enumerates fourteen plays which Munday wrote or assisted in writing. 'The Downfal of Robert, Earl of Huntingdon,' and 'The Death of Robert Earl of Huntingdon,' by Anthony Munday and Henry Chettle, both acted in February, 1598, are reprinted in Mr. Collier's 'Supplementary Volume to Dodsley's Old Plays.' Munday died Aug. 10, 1633.

MUNEEPOOR, a country in Asia, east of the British possessions on the Ganges, extends between 23° 45′ and 25° 30′ N. lat., and 93° and 94° 30′ E. long. Its valley, which constitutes by far the most valuable portion of the kingdom, is 2500 feet above the sea, with a length of 36 miles, and a breadth of 18. The valley consists of a fertile tract on either side of the Imphan Toorel River. The range of mountains which forms the western barrier of the valley is more elevated and extensive than any other between Silhet in Bengal and the western boundary of the Birman Empire. Another range, the Muring, which bounds the valley on the east, is less extensive and elevated. On the north and south the valley is not inclosed by a continuous range, but by the projecting ends of numerous ridges, which issue from two extensive mountain-tracts which lie in that direction.

The principal river of the vale of Muneepoor is the Imphan Toorel, which rises with two principal branches in the mountain-region lying north of the vale; the eastern is called the Eeril River, and the western the Khongba River. The two join about 24° 40′ N. lat., and the united river afterwards receives the Thobal, the Myettha, and the Koretub. The Imphan Toorel, after a course of 300 miles, interrupted by many falls and rapids, joins the Ningtha, a tributary of the Irawaddy.

The mountainous district of Muneepoor, which lies to the west of the vale, is traversed by the Barak or Soormah River, an affluent of the Brahmapootra, into which it falls near the village of Sunerampoor in Bengal. The course of this river through Muneepoor is upwards of 180 miles; but it is too rapid for navigation. It is only at the mouth of the Jeeree River that it becomes navigable for boats of any burthen.

The climate of the vale of Muneepoor is modified by its elevation above the sea and the mountains which surround it. The agricultural produce consists principally of rice, which forms the staple article of food, and the crops are everywhere very abundant. Tobacco, sugar-cane, indigo, mustard, different kinds of sesamum, and opium, are also cultivated, and cotton in the valleys of the mountainous districts. European vegetables are now much cultivated. In no part of India do the forests afford a greater variety of excellent trees than those which cover the mountains surrounding the vale of Muneepoor. Cedar of gigantic size, fir, and pine, occupy the highest portions of the ranges; oak of every size occurs on the several hills and mountains, and is employed as fuel and building material.

The animals employed in agriculture are buffaloes and cattle, more especially the former. The cattle are much superior to those of Bengal. The horses are of a diminutive size, rarely attaining a height exceeding thirteen hands, but they are hardy, vigorous, and highly valued. Goats and sheep are only reared on the slopes of the mountains. Elephants, deer, wild hogs, wild dogs, tigers, and many varieties of birds, are met with.

Gold is not found in Muneepoor, though it

occurs in the Kyen-duen, and in the rivers which fall into it; but iron is common in several parts, especially in the hills near Langthabal. There are many rich salt-springs.

The Muneepoorees, or inhabitants of the vale, appear to be the descendants of a Mongol colony, which in ancient times penetrated into this country: they rather resemble the Chinese and Birmese than the inhabitants of Bengal, being taller, stronger, and possessing a more vigorous mind than the latter. They have made considerable progress in the arts of civilisation. The language of the Muneepoorees is very different from that of Bengal, but the Bengalee is generally understood. Brahmanism seems to be the prevailing religion. Their number is estimated at 20,000.

The mountains which inclose the vale are occupied by different tribes of mountaineers; among whom are the Kupooees, Murams, and Loohooppas. They appear to be of Tatar origin, and are employed in agriculture.

The town of Muneepoor, which is nearly in the centre of the vale, was destroyed in the wars with the Birmese, and has not been rebuilt. The Raja of Muneepoor, who, since the peace of Yandaboo (1826), is placed under the protection of the British government in India, resides in the village of Langthabal, near the union of the rivers Khongba and Eeril.

MUNICH (in German, *München*), the capital of the kingdom of Bavaria, is situated on the left or west bank of the Isar, in a plain which is bounded on the east by low hills. It is in 48° 8′ 19″ N. lat., and 11° 35′ 15″ E. long. The population of the city is about 96,000, 6000 of whom are Protestants, and the rest Roman Catholics. Including the suburbs, the population is about 110,000. Munich is situated on the banks of the Isar, in a plain neither fertile nor picturesque. It is one of the most elevated cities in Europe, being nearly 1600 feet above the level of the sea. It has several broad straight streets, with lofty houses, in a good style, and some very handsome squares. Though not a place of strength, Munich is still surrounded with a rampart, and has seven gates leading to the suburbs, of which three are of modern date, and contain a great number of fine buildings. The largest suburb is the Au, lying beyond the two arms of the Isar, and connected with the old city by two bridges, one of stone, 347 feet in length, and the other of wood, 700 feet long.

Munich in the last century was a second-rate German capital, not distinguished for its architecture, but merely as the residence of the Elector of Bavaria. It owes its present architectural beauty and celebrity as a seat of the fine arts, chiefly to the late Ludwig I., king of Bavaria, who abdicated in favour of his son, March 21, 1848. The improvements in the city, including the erection of numerous public edifices, museums, churches, &c., have been planned and erected under his auspices, chiefly by one eminent architect Von Klenze. Sculpture and painting have been equally patronized, and the arts of painting in fresco, in encaustic, and on glass, have been revived, and carried to their former perfection.

The houses of the old part of the city of Munich are irregular in size and form; their fronts are crowded with windows, and are ornamented with stucco patterns and scroll-work. The great market-place (Schrannen-Platz) and neighbouring streets still retain the character of ancient Munich. In the new quarters and suburbs beyond the line of the old walls, the number of fine buildings which have been erected in recent times has scarcely a parallel in any other European capital. It stretches over an extent of ground nearly double that of the old town, which forms the central part.

The following are the principal public buildings:—The Alte Residenz, or Old Palace, is a vast pile, said to have been erected from the designs of Vasari, by Maximilian I., at the close of the 16th century. Vast as this pile before was, it has been greatly extended by two others, namely, the Neue Residenz (New Palace), or Königsbau, and the Festbau, which may be considered as incorporated with it, and forming together with it one enormous mass of building. The Königsbau, begun in 1826, from the designs of Leo von Klenze, adjoins the Old Palace at its south-west angle, and forms the north side of the Max-Joseph's Platz; while the centre is adorned with the splendid colossal monument of bronze of King Maximilian Joseph. The façade of the Königsbau is 406 feet in length. The exterior of the building is severe and monotonous. The interior has obtained for the building its celebrity, on account of the taste displayed in its decorations, the extensive employment of fresco-painting and sculpture, and the high talent manifested in them by Schnorr, Zimmermann, Kaulbach, Schwanthaler, and other artists. The second and later addition to the Residenz, also by Klenze, called the Festbau, has a façade towards the Hofgarten (of which it extends along the south side about 800 feet in length). The Hofgarten itself is a planted square of about 1100 feet from east to west, and 700 from north to south. The west side is lined throughout its whole extent by arcades, beneath which are cafés, &c., in that portion which belongs to the Bazaar; while that distinguished by the name of the Hofarkaden is decorated with a series of sixteen frescoes by Sturmer, Förster, Zimmermann, Schilgen, Eberle, and other artists, illustrating as many events in the annals of Bavaria. In continuation of the Hofarkaden are the arcades of the bazaar. Along the north side of the Hofgarten extends the old picture gallery arranged in a suite of rooms over another lengthened arcade.

The Glyptothek, or Sculpture Gallery, stands with its south or principal front towards a large open space called the Königsplatz. It is not more than about 220 feet square in plan, with a court in the centre; yet although in point of magnitude it is by no means remarkable, it is far more imposing in appearance and of ampler proportions than many edifices of much greater extent. The front is in the Greek style, of great beauty. The pediment contains beautiful sculptures, intended to exhibit the various operations of the plastic arts, modelling, sculpture, carving, &c. It was designed

by Wagner, but the figures were executed severally by Schwanthaler, Leeb, Haller, and others. The interior is divided into a series of rooms, which are filled with ancient and modern sculptures of the highest class.

The Pinakothek, another, and in some respects the best, of Klenze's works, is a much more extensive edifice than the Glyptothek, and altogether different both in its plan and its style of architecture. On the lower floor, at the west end of the building, are a library, and rooms for collections of prints and drawings. The rest consist of rooms required for the keeper and other officers of the establishment. The upper floor contains one of the most magnificent collections of pictures in the world, 1500 in number. Attached to the Pinakothek, are the Loggie, forming a line of 400 feet in extent, decorated throughout with arabesques on its walls, and with historical frescoes in the lunettes facing the arches, and subjects in each of the small cupolas covering the twenty-five compartments of this corridor.

The Allerheiligen Kapelle, or Chapel Royal, is in the Byzantine or Lombardic style of architecture. It is about 70 feet wide and 70 feet high, exclusive of the lower portion on each side, covered with a half-gable, whereby the entire width is increased to about 100 feet. The interior is very magnificent: the pavements, walls, arches, pendentives, domes—all is embellishment; and all that is not marble or mosaic is painting and gold. The principal walls are covered with frescoes on a gold ground.

On the south side of this magnificent chapel is what was formerly the Hof Theatre, but it is not now made use of as such, the larger and adjoining building being now the principal theatre.

On the west side of the Odeon-Platz are the Odeon Palace and Leuchtenberg Palace, whose opposite fronts towards the street that runs between them present two handsome façades in the Italian style.

Northwards from the Odeon-Platz runs the Ludwigs-Strasse, by far the handsomest and most regular street in Munich, having on its east side the Kriegs-Ministerium, the new public library, and new Ludwigs Kirche; on its western side, the Maximilians-Palast, Blind Institute, &c., and terminating in the spacious quadrangle of the new Georgianum, or university buildings. All these are modern buildings, of great magnitude and beauty, and they render the Ludwigs-Strasse one of the noblest streets in Europe.

The cathedral, or Frauenkirche, which was begun by Duke Sigmund in 1468, and completed twenty years afterwards, is a brick building, in a poor style of gothic architecture. Next in point of antiquity is St. Salvator's, now the Greek church, erected in 1494; after which, according to the succession of dates, comes St. Michael's, or the Hofkirche, built in 1783. It is 280 feet in length, and is in the form of a cross; and is a beautiful structure. The church of St. Caietan was built in 1675. It contains Thorwaldsen's magnificent work, the tomb of Eugène Beauharnois, duke of Leuchtenberg. Other churches are the Trinity church; Ludwigs Kirche; the church of St. Maria Hilf, in the Au suburb, a fine architectural work, in the pointed style; the new Basilica of St. Bonifacius, by Ziebland, in the Byzantine or Lombard style, of great beauty, and richly decorated.

Munich has numerous scientific and literary institutions. The Royal Academy of Sciences was founded in 1759. A general conservator has under his care the public library of 400,000 volumes and 8500 MSS., the Museum of Natural History, the Brazilian Museum, composed of the collections formed by Dr. Spix and Dr. Martius, the Physical, Mathematical, and Polytechnic collections, the Botanic Garden, the Cabinet of Medals, the Antiquarium or Cabinet of Antiquities, the Chemical Laboratory, the Observatory at Bogenhausen, &c. There are two gymnasia for the higher branches of education, the Royal Academy of Arts, the Military Academy, the Veterinary and Medical-Clinical Schools, the seminary for forming teachers, the Central Polytechnic School, and many others. The university was founded in 1472, and is a well appointed institution. The schools are numerous; as are also the charitable institutions.

The manufactures of Munich are of many different kinds, chiefly for the consumption of the city and neighbourhood: the articles made are linen, woollen cloth, calicoes, damask, silk, ribands, household furniture, piano-fortes, playing-cards, articles of gold and silver, coaches, excellent mathematical, surgical, optical, and astronomical instruments. There are likewise breweries, distilleries, tanneries, paper-mills, snuff-mills, and the celebrated Fraunhofer's (now Utzschneider's) manufactory of astronomical and optical instruments.

MUNICIPAL CORPORATIONS. The term Municipal is derived from the Latin adjective Municipalis, which signifies appertaining to a Municipium. The word Municipium had several early historical significations among the Romans. Our municipal corporations resemble the Italian cities in the later period of the Republic. After the Social War, B.C. 90, the Italian towns became members of the Roman state; they were subject to Rome, but retained their own local administration. Both the original Roman colonies in Italy and the Municipia (not colonies), as they were called, enjoyed this free condition. A municipal constitution was the characteristic of these Italian towns. The notion of an incorporated body, as applied to a town community, was familiar to the Romans, and their several municipalities were accordingly considered and called Republics (Res Publicæ). The Roman colonies in Italy had a popular assembly and a senate, as Rome had; the people chose their own magistrates, and they had legislative power in their own concerns. The history of these Italian municipalities is traced by Savigny, in his History of the Roman Law in the Middle Ages (vol. i.). As these communities existed wherever the Romans formed a provincial government, it is all but historically demonstrated that the town communities of our country, and of other parts of Europe where they exist, have either been directly transmitted from the Roman

town-communities as they existed under the empire, or have been formed on that model. The Romans had colonies in England, in the proper sense of that term; and the word Colonia always implies a local administration. It cannot be proved that the Saxons brought with them to England a system of town-communities; nor was their mode of settlement of such a character as to lead us to suppose that they could have established them at first. They certainly found them existing in the chief towns of the kingdom, and it is probable that this Roman institution has continued without interruption from the first reduction of England to a Roman province to the present time.

Under the Anglo-Saxon government the revenue of the king, or rather of the state, had been collected in each shire by the Shire-Reve, and in each municipal town by an elected functionary, called a Borough-Reve or Port-Reve. But after the Conquest, instead of the elective Saxon reve, there was placed over each shire a Norman Viscount, and over each municipal town a Bailiff, both appointed by the Norman king. In their eager desire to rid themselves of the royal bailiff, boroughs offered the king a higher sum to be collected from and by themselves, and transmitted directly to his exchequer, than he could farm their town for to an individual; and hence the frequent charters which we soon find issuing to one borough after another, granting it to the burgesses in fee-farm, that is, in permanent possession so long as they should punctually pay the stipulated crown-rent.

The interference of a royal provost in their internal concerns being thus withdrawn, the towns returned naturally to their former free municipal organisation. They had once more a chief administrator of their own choice, though in few cases was he allowed to resume either of the old designations, borough-reve and port-reve. In all cases he now acted as bailiff of the Norman king; accounted at the exchequer for the farm or crown-rent of the borough; in most, he received the Norman appellation of Mayor, which, denoting in that language a municipal chief officer, was less odious to the Saxon townsmen than that of bailiff; though in some he received and kept the title of bailiff only.

The charters of the Norman kings were addressed to 'the citizens,' 'the burgesses,' or 'the men' of such a city or borough; and the sum of the description of a burgess, townsman, or member of the community of the borough, as Madox in his 'Firma Burgi' observes, was this:—'They were deemed townsmen who had a settled dwelling in the town, who merchandised there, who were of the hans or guild, who were in lot and scot with the townsmen, and who used and enjoyed the liberties and free customs of the town.' The titles to borough freedom by birth, apprenticeship, and marriage, all known to be of very remote antiquity, seem to have been only so many modes of ascertaining the general condition of established residence. The freemen's right of exclusive trading had some ground of justice when they who enjoyed it exclusively supported the local burdens. Edward III.'s laws of the staple authorised the residence of non-freemen in the staple towns, but at the same time empowered the community of the borough to compel them to contribute to the public burdens; and under these regulations it is that the residence of non-freemen appears first to have become frequent.

The progress of wealth, population, and the useful arts produced, in many of the greater towns, the subdivision of the general community into *guilds* of particular trades, called in many instances since the Norman æra *companies*, which thus became avenues for admission to the general franchise of the municipality. In their greatest prosperity these fraternities, more especially in the metropolis, became important bodies, in which the whole community was enrolled; each had its distinct common-hall, made bye-laws for the regulation of its particular trade, and had its common property; while the rights of the individuals composing them, as members of the great general community, remained the same.

The sole legislative assembly in every municipal town or borough was originally the Saxon *folk-mote*, or meeting of the whole community, called in many places the *hundred*, and where held within doors, the *hus-ting* or the *common-hall*. This assembly was held for mutual advice and general determination on the affairs of the community, whether in the enacting of local regulations, called *burgh-laws*, the levying of local taxes, the selling or leasing of public property, the administration of justice, the appointment of municipal officers, or any other matter affecting the general interests. In this assembly, held commonly once a week, appeared the body of burgesses in person, to whom, together with their officers, whom they elected annually, every general privilege conveyed by the royal charters was granted; and however vested in later times, every power exercised in the ancient boroughs has derived its origin from the acts of this assembly.

The richest and most influential persons being generally chosen by the inhabitants at large to the highest places in the municipal councils, were often tempted to seek the perpetuation of their authority without the necessity of frequent appeals to the popular voice, and even to usurp powers which it had not delegated at all. Such usurpations however were often vigorously resisted by the community at large; and the contests were sometimes so violent and obstinate as to lead to bloodshed. But in course of time, the crown itself, so long indifferent to the details of municipal arrangements, found sufficient motives for encouraging these endeavours of internal parties to form close ruling bodies, irresponsible to the general community.

We find in the reigns of Edward VI., Mary, and Elizabeth, besides seventeen boroughs, restored to parliamentary existence, forty-six now first beginning to send members to parliament, making altogether an addition to the former representation (as no places were now omitted) of sixty-three places returning 123 members. But the most important feature in this policy of the crown at this period —that which mainly contributed to attain the object of that policy—was its novel assumption

of the right of remoulding, by governing charters, the municipal constitution of these new or revived parliamentary boroughs. Most of these charters expressly vested the local government, and sometimes the immediate election of the parliamentary representatives, in small councils, originally nominated by the crown, to be ever after self-elected. This was the first great step on the part of the crown in undermining the political independence of the English municipalities. The Stuarts followed the example of Elizabeth, and attacked the constitutions even of the prescriptive parliamentary municipalities.

The abuses which had arisen in Municipal Corporations were for more than two centuries a matter of constant complaint. But nothing was done to reform these abuses until after the passing of the Reform Act. In July 1833, the king issued a Commission under the Great Seal to twenty gentlemen 'to proceed with the utmost dispatch to inquire as to the existing state of the Municipal Corporations in England and Wales, and to collect information respecting the defects in their constitution—to make inquiry into their jurisdiction and powers, and the administration of justice, and in all other respects; and also into the mode of electing and appointing the members and officers of such corporations, and into the privileges of the freemen and other members thereof, and into the nature and management of the income, revenues, and funds of the said corporations.'

The commissioners thus appointed divided the whole of England and Wales into districts, each of which was, in most cases, assigned to two commissioners. Their reports on individual corporations occupied five folio volumes; abstracts of information relative to important matters occupied a portion of a sixth (the first printed), and the results of the whole inquiry were presented in a general Report signed by sixteen of the commissioners.

On the 5th of June, 1835, Lord John Russell brought in a bill to remedy the defects complained of; and on the 9th of September the royal assent was given to 'an Act to provide for the regulation of Municipal Corporations in England and Wales.' (5 & 6 Wm. IV. c. 76.) We shall here briefly notice the principal features of this measure.

The limits to which the provisions of the bill extended, included in round numbers a population of about two millions. This number was not materially altered by the modifications introduced in the bill in its passage through parliament. The number of boroughs originally proposed to be directly included in the operation of the bill was 183. This number was reduced to 178. The boundaries of the boroughs were settled by the act for Corporation Reform. Those in the first part of schedule A (appended to the act), amounting to 84, and those in the first part of schedule B (also appended to the act), amounting to 9, being parliamentary boroughs, their parliamentary boundaries were taken as settled by the Boundary Act (2 & 3 Wm. IV. c. 64) until altered by parliament. In the remaining boroughs the municipal boundaries remained as before, until parliament should otherwise direct. The division of the boroughs into wards was also effected for electoral purposes.

The Municipal Reform Act is almost wholly confined to the attempt to render the functionaries of the municipalities eligible by, and responsible to, the persons whose interests they are appointed to watch over and protect.

The constituency of our corporations are usually known by the name of the *Freemen*. The rights of freedom, or citizenship, or burgess-ship, being privileges confined to few persons, were in many cases of considerable value to the possessor, particularly when they conferred a title to the enjoyment of the funds derivable from corporation property, or of exemption from tolls or other duties. It was provided by the act that although the public interests were to be insured by the prospective abolition of all the privileges and exemptions in question, the individuals already interested in them should not have their personal expectations thereby destroyed. On this principle the act reserved the respective rights of the freemen and burgesses, their wives and widows, sons and daughters, and of apprentices, to acquire and enjoy the same share and benefit in the lands and other property, including common lands and public stock of the borough or corporation, as well as in property vested for charitable uses and trusts, as fully and effectually as might have been done if the act had not been passed (s. 4). The act also reserved the right to vote for members of parliament to every person who, if the act had not been passed, would have enjoyed that right as a burgess or freeman by birth or servitude. But the 13th clause provided that after the passing of the act no person should be enrolled a burgess in respect of any other title than that enacted by the act. The constituencies of a municipality now consist of every male person of full age, who on the last day of August in any year shall have occupied premises within the borough continuously for the three previous years, and shall for that time have been an inhabitant householder within seven miles of the borough, provided that he shall have been rated to the poor rates, and shall have paid them and all borough rates during the time of his occupation. It is necessary to refer to the act if a person wishes to be fully acquainted with its provisions as to the constituencies of Municipalities.

Excepting that of election and control of its officers, the constituency has none of those exclusive privileges conferred on them which have been usually enjoyed by the freemen. One of these was the privilege of trading within the limits of the municipality, exclusively conferred on those who might be free of the borough or of certain guilds, mysteries, and trading companies. By the 14th section of the Municipal Act, it is enacted that 'Every person in any borough may keep any shop for the sale of lawful merchandises by wholesale or retail, and use every lawful trade, occupation, mystery, and handicraft, for hire, gain, sale, or otherwise, within any borough.' But London is still excepted from the operation of this act, and the corporation of London has often

made the attempt to compel persons to take up their freedom.

The functionaries, together with the constituency, complete the body of the corporation. Both have borne the most various denominations hitherto—the whole body now, in all municipalities, bear the name of 'the Mayor, Aldermen, and Burgesses,' and they are constituted corporations.

The 25th clause provided for the election in every borough of a Mayor, of a certain number of persons to be the Aldermen, and of a certain number of other fit persons to be the Councillors.

The *Councillors*, who are collectively called 'the Council' of the borough, are the body amongst whom the *Mayor* and *Aldermen* are chosen, and of whom those functionaries continue after their election to constitute a part. The council collectively is intrusted with the whole of the deliberative and administrative functions of the corporation. They appoint the Town-Clerk, Treasurer, and other officers for carrying into execution the various powers and duties vested in them by the act. They may appoint as many committees either of a general or special nature for any purposes which in their judgment would be better regulated and managed by such committees. The acts of every committee must be submitted to the whole council for approval, lest the borough should be governed by a small knot of persons, whose appointment as a committee would thus become as much a matter of favour, contest, and corruption, as that of the old municipal governing bodies. The council execute all the offices previously executed by the corporate bodies whom they superseded. They appoint from their own body a Watch Committee, of which the mayor is, by virtue of his office, the head; and this committee appoints a sufficient number of effective men to act as constables and preserve the peace by day and night.

The Council have the control of the borough fund; any surplus in which, after payment of all necessary expenses and of all just demands, they are to apply for the public benefit of the inhabitants and improvement of the borough. If the fund be insufficient they are to order a borough rate, in the nature of a county rate, to make up the deficiency, for which special purpose alone they have the powers of justices of peace given to them for assessing, collecting, and levying it.

When a commission of the peace is granted to a borough, the council provide the requisite police officers. As to the provisions for the election of Mayor, Aldermen, Town-Clerk, Treasurer, Auditors, Assessors, and the duties, it is necessary to consult the 5 & 6 Wm. IV. c. 76.

With regard to the *administration of justice* in boroughs, the Corporation Reform Act made several alterations. In the boroughs named in schedules A and B, the Queen is empowered to appoint as many persons as she may think proper to be *Justices of the Peace*, who are not required to have any qualification by estate. The council also of any borough may, if they think it necessary that one or more salaried *Police Magistrates* should be appointed, make a by-law fixing the amount of salary, and thereupon the Queen may appoint such person as she may think fit, so that the person be a barrister of five years' standing. The appointment is given to the Crown in order that the administration of justice may be above the suspicion of being tainted by party or local interests, a suspicion which might be incurred, and even deserved, were the appointment made by the council. The justices of the peace may appoint a clerk, with respect to whom some useful provisions will be found in s. 102.

In boroughs, where the council shall signify their desire to that effect by petition, setting forth the grounds of their application, the state of the gaol, and the salary which they are willing to pay, the crown may appoint a *Recorder* for any one such borough, or for any two or more boroughs conjointly. The Recorder must be a barrister of not less than five years' standing. He is, by virtue of his office, a justice of the peace of the borough, and is to have precedence within the borough next after the mayor. Such boroughs are to have separate courts of Quarter Sessions of the Peace, which is to be a court of record, having cognizance of all crimes, offences, and other matters cognizable by any court of quarter-sessions for counties, the recorder being enabled to do all things necessary for exercising such jurisdiction, notwithstanding his being the sole judge.

Towns which are not incorporated may obtain a charter of incorporation by petition to the Privy Council (1 Vict. c. 78, s. 49). Manchester, Birmingham, Sheffield, and Bolton, have been incorporated under this regulation.

By s. 139 all advowsons, rights of presentation or nomination to any benefice or ecclesiastical preferment, in the gift of the corporate body, were required to be sold under the direction of the Ecclesiastical Commissioners; the proceeds to be vested in government securities, and the annual interest carried to the account of the borough fund.

The management of charitable trust funds was taken from municipal bodies by s. 71: the administration of such funds is now placed in the hands of trustees who are appointed by the Lord Chancellor.

Ireland.—The borough system of Ireland may be described in general as an immediate branch from that of England, and the mode of incorporation adopted by the crown in erecting the modern boroughs, presents little more than a parallel to the course followed in England.

The evils of the Irish municipal system have been mitigated by the act for Parliamentary Reform in Ireland, and by an act passed in 1840 (3 & 4 Vict. c. 108), 'for the regulation of municipal corporations in Ireland.'

Scotland.—The early history of the Scottish boroughs is involved in much obscurity, and it is not till about the twelfth century that we have a steady light of record to guide us. We then find various places denominated 'burgi,' or burghs, and some with that term as a component part of their name, as Edinburgh, Roxburgh, Jedburgh, Musselburgh. Some of these boroughs were the

property of the king, and others, as Musselburgh, the property of a subject. Musselburgh belonged to the church, and from the territory on which it stood being erected first into a barony, and afterwards into a regality, with exclusive jurisdiction, it was successively a burgh of barony and a burgh of regality. Other communities were mere villages, but some, like Berwick, were raised from that and higher conditions to be burghs of the king in demesne. The burghs were at this time the property of the king or other lord, and disposed of accordingly.

A series of the royal boroughs of Scotland has been made by Chalmers ('Caledonia,' vol. i. p. 775), as they successively appeared to him in charters. This list, however, must not be taken as perfectly accurate, and, indeed, Chalmers himself furnishes materials for its correction.

The most ancient existing charters to the boroughs of Scotland are for the most part grants or confirmations of particular privileges to the burgesses, and do not contain words of incorporation. The charters are generally of one description, and convey to the burgh and burgesses, or to the burgesses of the burgh, the privileges mentioned in the deed. The usual privileges are, that their goods shall be free of toll or tribute, that they shall not be distrained but for their own debts, and that they shall have a certain market. Other privileges are sometimes conferred, such as the right of a merchant gild. These privileges were not confined to the royal burghs; similar concessions were granted by the king to the burghs of subjects; and they in their turn imitated the royal example, and, like the monastery of Dunfermline, to 'our burgesses of Dunfermline and their heirs for ever,' confirmed or bestowed various mercantile privileges.

The ancient foundation of burgess-ship appears to have been possession of a tenement of land within a burgh. An exception was early made in favour of a son not yet foris-familiated, and this was subsequently extended in various directions, but the prime qualification was property. Every person who thus became a burgess swore fealty to the king and his baillies and the community of the burgh, and became bound to pay to the king a certain annual sum for his land, and to watch and ward it. The other principal source of the royal revenue from the burghs were the customs, great and small.

The history of the Scotch boroughs may be collected from the following works:—Chalmers's *Caledonia*, vol. i.; Connel *On the Election Laws of Scotland;* and *Reports of the Commissions of the House of Commons on the State of the Scottish Boroughs.*

MUNSTER, one of the four provinces into which Ireland is divided. It comprehends the southern part of the island, and is bounded W. S. and S.E. by the Atlantic Ocean; N. and N.E. it is conterminous with the provinces of Connaught and Leinster. It is comprehended between 51° 25′ and 53° 12′ N. lat., and 6° 56′ and 10° 32′ W. long. The greatest length, from the banks of the Shannon below Banagher to Mizen Head, is 144 miles; the greatest breadth from Black Head, in Galway Bay, to the mouth of Waterford Harbour, is 119 miles. The area is 9476 square miles. The population in 1841 was 2,396,161.

The general character of the surface is mountainous. The north-western extremity beyond the Shannon is overspread by an irregular group of hills or mountains, of which the Slieve Baughta Mountains and the Inchiquin Mountains form part. Two ranges of mountains extend nearly across the province from N.N.E. to S.S.W., inclosing the long narrow basin of the Blackwater. The western side of the province is the most elevated; and the principal streams (except the Shannon) flow between the mountain ranges from west to east.

From the mouth of Waterford Harbour to Baltimore the coast runs W.S.W., marked only by small bays, and by the æstuaries of several rivers. These æstuaries form the excellent harbours of Waterford, Dungarvan, Youghal, Cork, and Kinsale. At the S.W. extremity of this line of coast is Cape Clear. The S.W. and W. coasts from Cape Clear are marked by a succession of bluff promontories, formed by the extremities of the mountain ranges, with the deep intervening bays of Dunmanas, Bantry, Kenmare, and Dingle. From Dunmore Head, at the northern extremity of Dingle Bay, the coast runs N.E., retaining its broken outline, and indented by the Bay of Tralee and the æstuary of the Shannon.

The chief rivers are the Suir, the Blackwater, the Lee, and the Bandon, all of which, except the Suir, in the upper part of its course, and the others just above their outfall, have a general direction from west to east. There are not many lakes nor any of great extent; the principal are the Lakes of Killarney. The province is divided into the six counties of Clare, Cork, Kerry Limerick, Tipperary, and Waterford.

The kingdom of Munster existed at an early period of Irish history; and in the 11th century Brian, surnamed Borohme or Boru, acquired so high a reputation for valour and wisdom as to be enabled to usurp the sovereignty of Ireland antecedently held by the king of Meath. Brian fell at Clontarf, fighting against the Danes and such of the Irish as supported them. The sovereignty of Ireland (which was indeed little more than nominal) did not remain in his family, the supremacy of Roderic O'Connor, king of Connaught and paramount of the Irish princes, being afterwards recognised by the chieftains of Munster. Henry II. in person landed at Waterford in 1172, and subdued Munster, but Henry's wars having obliged him to weaken his army in Ireland, the natives rose in rebellion. When the English rallied, Munster was again subdued, and parcelled out among various Anglo-Norman barons.

Munster, with the exception of the county of Clare, was divided into counties as at present in the reign of Henry VIII. Clare was formerly considered as belonging to Connaught rather than Munster. It was made shire-ground with Connaught in the eleventh year of Elizabeth's reign. It remained part of Connaught till 1601, when it was added to Munster.

MÜNSTER, the most north-western of the three governments into which the Prussian province of Westphalia is divided, is bounded N. by Hanover, E. by Minden, S. by Arensberg and the Rhein-provinz, and W. by the Netherlands. Its area is 2797 square miles, and the population, in 1846, was 421,044, about 9-10ths of whom are Catholics. The government presents a surface diversified by mountains, hills, and plains; the northern part is drained by the Ems, and the southern districts by the Lippe, a feeder of the Rhine. The Teutoburgerwald range runs N.W. across the territory of Münster, forming part of the watershed between the Ems and the Weser. The country is not very productive in corn; flax and hemp are the chief products. Linen is the staple manufacture. Swine are very numerous. This government comprises a large portion of the former prince-bishopric of Münster, of which Hanover and Oldenburg got the rest. A railway runs S. from the city of Münster, and joins the Cologne-Hamburg-Berlin line at Hamm.

Münster, the capital of Westphalia, and of the government of Münster, situated on the river Ahe, in 51° 58′ N. lat., 7° 36′ E. long., in a flat country, is a tolerably well built commercial and manufacturing town, with about 21,000 inhabitants. The streets are broad; the houses lofty, but irregular. Of the public buildings the most worthy of notice are—the cathedral; the church of St.-Lambert, built in the finest Gothic style; the palace of the bishop; the senate-house; and the mansions of several of the nobility. The town has a Catholic college, a gymnasium, surgical and veterinary schools, a botanical garden, a school for deaf-mutes; and manufactures of woollen cloths, leather, starch, &c. The city is the seat of all the great offices of the province of Westphalia. The trade in linens, woollens, yarn, Rhenish wine, hams, &c., is very considerable. Münster is celebrated on account of the peace concluded in it Oct. 24, 1648, which put an end to the Thirty Years' War.

Bocholt. *Borken*, S.W. of Münster, on the Aa, has 2860 inhabitants, who manufacture linen, broad-cloth, serge, and chicory. *Koesfeld*, W. of Münster, on the Berkel, is surrounded by old fortifications, and defended by a castle; the manufactures are linen and woollen cloth; the town has a gymnasium, and a population of 3500. *Recklinghausen* [Aremberg] *Steinfurt*, N.W. of Münster, a residence of the princes of Bentheim-Bentheim, has a population of 2400, who manufacture linen and leather. *Warendorf*, E. of Münster, on the Ems, has a gymnasium, a madhouse, several bleach-works, an important linen market, and 4200 inhabitants, who manufacture linen and broadcloth.

MÜNSTER. [Rhin, Haut.]

MÜNSTER, SEBASTIAN, born at Inglesheim, in the palatinate of the Rhine, in 1489, became a Franciscan monk, but afterwards adopted Luther's reformation, and repaired to Basel, where he was made professor of Hebrew. He died of the plague, at Basel, in 1552. His works are—1, 'Biblia Hebraica Charactere Singulari apud Judæos Germanos in usu recepto, cum Latina planeque Nova Translatione, adjectis insuper e Rabbinorum Commentariis Annotationibus,' &c. 2, 'Grammatica Chaldaica,' 4to. 3, 'Dictionarium Chaldaicum.' 4, 'Dictionarium Trilingue.' 5, 'Captivitates Judæorum Incerti Auctoris.' 6, 'Catalogus omnium Præceptorum Legis Mosaicæ, quæ ab Hebræis sexcenta et octodecies numerantur.' 7, 'Organum Uranicum; Theoria omnium Planetarum Motus.' 8, Cosmographia Universalis.' 9, 'Rudimenta Mathematica in duos libros digesta.' 10, 'Horologiographia.'

MUNTJAC. [Deer.]

MUNYCHIA. [Athens.]

MURA'D (AMURA'T) I., son of Orkhan, sultan of the Ottomans, succeeded his father, A.D. 1360. He conquered part of Macedonia and Thessaly, concluded a treaty of peace and alliance with John Palæologus, emperor of Constantinople, and married the daughter of the despotos or prince of Servia. While Murad was in Asia his son in conjunction with Andronicus, the son of John Palæologus, usurped the supreme power of their fathers in Europe; for which Murad caused his son's eyes to be put out. Murad extended his power into Asia Minor, and was killed by a wounded Albanian while inspecting the field of battle after the fight on the plains of Cassovia, A.D. 1389, with Lazarus prince of Servia, and his allies the Hungarians, Dalmatians, &c., in which Lazarus was taken prisoner.

MURAD II., son of Mahomet I., succeeded his father A.D. 1421. Murad turned his arms against Manuel, emperor of the East, ravaged Macedonia and Thracia, and threatened Constantinople; but Manuel succeeded in stirring up an insurrection in Asia, in favour of Mustapha, Murad's younger brother. Murad was obliged to leave Europe to quell the insurrection, and soon after the Greek emperor died, A.D. 1424. Murad dispersed the insurgents at Nicæa, and had his two brothers strangled, in order to take away all pretext for further insurrections. On his return to Europe, he obliged John Palæologus II., successor to Manuel, to pay him tribute. He made war upon Ladislaus, king of Hungary and Poland, and won two great battles over the Hungarian forces commanded by the gallant Hunnyades, in the last of which, that of Varna, 1444, Ladislaus himself was killed.

Murad after a very warlike reign abdicated the throne in favour of his son Mahomet, and retired to Magnesia, but soon resumed his authority, and turned his arms against Scanderbeg, with no great success. He then marched against Hunnyades, whom he defeated. Murad died at Adrianople, in 1451.

MURAD III., son of Selim II., succeeded his father in 1575. In 1578 he began a war against Persia, which lasted till 1590, when peace was made. In 1592 he invaded Hungary, but was repulsed, and lost Orsowa and Silistria. Murad died at Constantinople, in January 1595.

MURAD IV., nephew of Mustapha I., succeeded his uncle in 1622. The first years of his reign were marked by reverses on the side of Hungary as well as on the frontiers of Persia.

In 1635 he repaired in person to the army against Persia, but was obliged to retire; but in 1637, he again took the field, and in the following year captured Bagdad after an obstinate defence. In 1639 he returned to Constantinople, and made peace with Persia, retaining Bagdad. Murad died in 1640.

MURÆNA, an apodal malacopterygious fish of the family *Muræniдæ*, and resembling the eel in form. It has no pectoral fins. The orifices of the gills are small and open, one on each side. In each jaw there is a single row of teeth. The dorsal and anal fins are very low, and are united. The *Muræna Helena* is the type of the genus. It is found in the Mediterranean and Portuguese seas, and in one instance has been taken on the coasts of Britain. It grows to the length of between 4 and 5 feet, and even more. The body is smooth and glossy, beautifully mottled with salmon colour, yellow, and purple. The head is large and swollen, which gives the fish a disagreeable aspect. It is excellent eating, and was highly esteemed by the ancients, who reckoned it among the best of fishes for the table, and kept it alive in fish-ponds.

MURÆ'NIDÆ, or ANGUI'LLIDÆ, a family of fishes belonging to the section of the *Malacopterygii* called *Apodes*. These fishes have an elongated and often cylindrical body, covered by a thick and soft skin in which the scales are deeply imbedded and scarcely apparent. They have no cæca, but nearly all are furnished with a natatory bladder. In the first group, which constitutes the great genus *Muræna* of Linnæus, the opercula are small and enveloped in the skin; the gill-opening is small, and is situated far back, an arrangement which, by more completely protecting the branchiæ, permits these fishes to live a long time out of water: they have no ventral fins.

The species of the genus *Anguilla* are distinguished by the possession of pectoral fins. The dorsal, anal, and caudal fins are united. The dorsal fin commences at a considerable distance behind the pectorals. The upper jaw is shorter than the lower; the gills opening by a small aperture on each side, situated beneath the pectoral fin. Three (if not four) species of *Anguilla*, or Eel, are found in this country—the Sharp-Nosed Eel, the Broad-Nosed Eel, and the Snig.

The Conger Eel (*Conger vulgaris*) is the type of a genus distinct from *Anguilla*, and is exclusively marine. For an account of the Electric Eel, see GYMNOTUS.

Among the British examples of this family we may mention the Anglesey Morris (*Leptocephalus Morrisii*), the Beardless Ophidium (*Ophidium imberbe*), the Sand Eel (*Ammodytes Tobianus*), and the Sand Launce (*Ammodytes Lancea*).

MURAT. [CANTAL.]

MURAT, JOACHIM, was born in Perigord, in 1767. His father was a country innkeeper. Young Joachim was placed at the College of Cahors, and destined for the church; but he preferred the army, and enlisted into a regiment of chasseurs, from which he was dismissed for insubordination. He then took charge of his father's horses until the breaking out of the Revolution, when he obtained a commission in a regiment of chasseurs, and rose rapidly to the rank of colonel. He avowed Jacobin principles, but these did not prevent him from assisting Bonaparte in the affair of the Sections in 1795; and he was rewarded by being placed on the personal staff of the future emperor in the Italian campaign of 1796. He commanded the cavalry in the campaigns of Egypt, Italy, Austria, and Prussia; and in all, at Aboukir, Marengo, Austerlitz, Jena, Eylau, and Friedland, his services were brilliantly conspicuous.

After the Egyptian campaign, he obtained the hand of Caroline, youngest sister of Napoleon; and in 1806 was created grand-duke of Berg and Cleves. In 1808 he commanded the French army in the invasion of Spain; whence he was recalled, and sent to Naples to ascend the throne of that kingdom. In 1812 he accompanied Napoleon on the expedition to Russia, in the command of the cavalry of the grand army. During this expedition, Murat displayed his usual valour, but disagreements arose between him and Napoleon, and finally, after the battle of Leipzig, he deserted his brother-in-law, and allied himself with his enemies. By this defection he for a time saved his own throne; but the delay of the Congress of Vienna to recognise his regal title hurried him, in 1815, into hostilities against the allied powers. He was compelled to flee from his kingdom; and afterwards landing in arms on the coast of Calabria with a few followers, he was captured, and shot by the sentence of a Neapolitan court-martial.

MURATO'RI, LUDOVI'CO ANTONIO, born in 1672, at Vignola, in the Modenese territory, studied at Modena, and showed an early aptitude for historical and philological studies. He was appointed one of the librarians of the Ambrosian Library at Milan. In that collection he discovered several inedited MSS., from which he made extracts, which he published with notes and comments, under the titles of 'Anecdota Latina,' and 'Anecdota Græca.' Some years afterwards he was recalled to Modena, and made librarian there; a place which he retained for the rest of his life.

After this appointment Muratori devoted himself entirely to the study of the Italian records of the middle ages; and completed his great work, 'Rerum Italicarum Scriptores, ab anno Æræ Christianæ Quingentesimo ad Millesimum Quingentesimum,' in 28 vols. fol. The first volume of this immense collection was published in 1723, and the last in 1751. He also wrote an abridgment of his Dissertations in Italian, which was published after his death: 'Dissertazioni sopra le Antichità Italiane.' He likewise wrote in Italian, 'Annali d'Italia dal Principio dell' Era Volgare sino all' anno 1750,' which has been continued by Coppi. Another work of Muratori is his 'Novus Thesaurus Veterum Inscriptionum,' 4 vols. folio, 1735. His work entitled 'Antichità Estensi,' 2 vols. folio, Modena, 1710-40, is the Fasti of the house of Este in its various branches. He also wrote several historico-political treatises in support of the rights of his sovereign the duke of Modena. Muratori wrote many minor works, which were

collected and published at Arezzo, in 1787, in 17 vols. 4to. He died at Modena in 1750.

MU'RCIA, a division of Spain, with the title of *Kingdom*, situated between 37° 18′ and 39° 18′ N. lat., 0° 40′ and 3° 6′ W. long., is bounded N. by the province of Cuenca, N.W. by La Mancha, W. by Jaen and Granada, E. by Valencia, and S. by the Mediterranean. It is about 130 miles long from N. to S., and 110 from E. to W. Its area is 7844 square miles. Its population in 1833 was only 474,315. Murcia is within the circuit of the captain-general of Valencia, and under the jurisdiction of the royal chancery of Granada. The province is intersected by numerous ranges of mountains, which are separated by extensive valleys and plains. The soil is generally parched for want of water, the only rivers being the Segura and its tributaries the Mundo, Taivilla, Moratalla, Caravaca, Quipar, and Sangonera; the valleys in which these rivers flow are very fertile, particularly that called the Huerta or Garden of Murcia, but the unwatered low lands are arid and sterile as the desert, and these, with the mountains, which are mostly bare and uncultivated, cover two-thirds of the surface of the province. Wherever there is water however and industry to apply it to the irrigation of the soil, the crops are luxuriant and never fail to yield a very profitable return. Both mountains and plains yield in parts excellent pasture.

The coast between Cartagena and the kingdom of Granada presents a series of steep and lofty cliffs; eastward from Cartagena it is low and sandy. The whole coast is studded with watch-towers at intervals. The most remarkable cape is that of Palos, W. of which lies a singular land-locked bay called La Encanizada de Murcia, but it admits vessels of small draught only by a narrow channel at its north-eastern extremity.

The climate of Murcia is temperate and delightful on the sea-coast and among the mountains, but intensely hot in the plains. Storms are not unfrequent in the spring; the summers are exceedingly hot; the autumns are delightful, winter is almost unknown; the sky is throughout the year so blue and bright as to have gained for Murcia the title of 'the most serene kingdom.' But on the other hand rain is rare; in some parts a whole year will elapse without the fall of a shower.

The mountains are principally of limestone; sandstone, marl, lignite, and gypsum are found. Porphyry, slates, fine marble, rock-crystal, freestone, bole, alum, and nitre, are found in various parts of the province. Near Hellin is a mine of sulphur, at Villena a saltpit, and saltpetre abounds in the neighbourhood of Cartagena. Several argentiferous lead mines are worked; iron and copper are found.

The common products are wheat, barley, rye, rice, maize, vegetables, oranges, dates, lemons, melons, and pomegranates. The most commonly cultivated trees are the mulberry, the date-palm, and the olive; evergreen and other oaks, poplars, and carobs are in some parts numerous. The sugar-cane thrives, but is not cultivated to any extent. The pines on the Sierra de Segura form the largest forest in the south of Spain. The oleander, cistus, tamarisk, prickly pear, and aloe grow wild and luxuriantly. Great quantities of barilla are produced on the sea-coast; silk and oil are extensively produced, and also saffron and wine. The *esparto* rush grows most luxuriantly in the neighbourhood of Cartagena.

Sheep and goats are numerous, horned cattle are scarce; pigs are very fine. Game is found in vast quantities; fish is abundant on the coast. Wolves, foxes, and wild boars inhabit the mountains.

The manufactures are few and unimportant. Agriculture and mining give employment to all the disposable industry of Murcia; but the people descended from the ancient Phœnician colonists, the Iberians, and the Moors, are proverbially indolent, votaries of tobacco and the siesta. The language of Murcia is Castillian, with a considerable mixture of Arabic and the Valencian dialect. Corn and wine are exported when the harvest or vintage is good, otherwise they are imported from Valencia. Raw silk, barilla, some cutlery, saffron, and articles made of the esparto rush, are the principal exports. The imports are vegetables from Valencia; beef and mutton, oil, spices, ironware, linen and woollen goods, and silk stuffs, for there is not industry enough in the province to manufacture the raw silk produced.

The principal towns are MURCIA; CARTAGENA; *Lorca*, an old town with clean streets and well-built houses on the right bank of the Sangonera, population about 20,000; Chinchilla, with 11,000 inhabitants; Albacete, with 10,000; Villena, with 9500; Hellin, with 8000; Cieza, with 6500; Almanza, the Almantica of the Romans, with 6000; Segura de la Sierra, with 4000; Jumilla, with 8000, celebrated for the battle fought in its neighbourhood in 1707, which secured the crown of Spain to Philip V., the first of the Bourbon dynasty; Tutana, with 12,000; Alhama, with 4000, renowned for its baths and hot-springs; and Molina, with 3000 inhabitants.

MURCIA, the capital of the kingdom of Murcia in Spain, in 38° 2′ N. lat., 1° 14′ W. long., at a distance of 228 miles S.E. from Madrid, is situated in a valley on the left bank of the Segura, and has a population of 36,000. It is the residence of the bishop of Cartagena, whose diocese comprehends almost the whole of the kingdom of Murcia. The principal buildings—are the cathedral, 10 other parish-churches, 5 colleges, an hospital, the bishop's palace, the town-hall, the granary, the custom-house, and a house for the public weighing of silk. The town has 2 public libraries, and several inns. Many of the public buildings were injured by the earthquake of 1829. Murcia was formerly fortified, but is now open on every side. Four of its ancient gates however remain. The streets are narrow, crooked, and irregular, but clean. The houses are mean; many have gardens attached, filled with orange or palm trees. There are many squares. A handsome bridge of two arches connects the city with the suburb of San-Benito on the right bank of the Segura. The city has several potteries, cloth factories, tanneries, oil-mills, establishments for the spinning of silk and for the manufacture of

soap and white lead. There are also royal factories of gunpowder and saltpetre. There are important glass works in the environs of the town. Wine and provisions of all kinds are exceedingly cheap. The manufacture of the esparto rush into baskets, cordage, sandals, &c., employs many hands.

MURDER. By the law of England, murder is the destruction of human life, accompanied with an intention to kill, or do great bodily harm, or wilfully to place human life in peril; or resulting from an attempt to commit some other felony; or occurring in the course of resistance offered to ministers or officers of justice, or others rightfully engaged in carrying the law into execution. All other cases of culpable homicide, in which death is produced involuntarily, but is occasioned by want of due caution; or where, though death is produced voluntarily, the crime is extenuated by circumstances; or where a minister or officer of justice is killed, but sufficient authority did not exist, or was not communicated to the party before the fatal blow was given; or where any other circumstances essential to the crime of murder are wanting—amount only to simple felonious homicide, or, as it is commonly called, without regard to the age or sex of the party killed, *Manslaughter*.

In the modern law of England the crime of murder is characterised by having been committed with malice aforethought, or, as it is sometimes called, malice *prepense*. But the term, 'malice aforethought' is frequently applied to a state of things in which there is no malice in the ordinary sense of the term, but only malice in a legal sense. If A shoot at B with intent to kill him, but by mere accident kill C, this is a killing from implied malice.

Every homicide is presumed to be malicious until the contrary be shown. But circumstances may extenuate the offence, and reduce it from the crime of murder to that of manslaughter; or the act may amount either to justifiable or excusable homicide. In cases of justifiable homicide, and, according to modern practice, in cases of excusable homicide, the party causing the death is discharged from responsibility.

To constitute legal homicide, the death must result from injury to the *person* (as contradistinguished from causes operating upon the *mind*) occasioned by some act done by, or some unlawful omission chargeable upon, the party to whom such homicide is imputed. The terms 'wilful omission' apply to every case of noncompliance with a legal obligation which the party may be under, to supply food, clothing, or to furnish any other assistance, or to do any other act for the support of life, or for the prevention of injury to it. It is not homicide unless death take place within a year and a day after the injury; or, in other words, it is not considered homicide when the party injured survives a whole year, exclusive both of the day of the injury and of the day of the death; nor where the death is to be attributed to unskilful treatment, or other cause not resulting from or aggravated by the injury sustained.

The law of homicide applies to the killing of aliens, except alien enemies killed in war; to felons, except when executed according to law; and to persons outlawed, whether on civil or on criminal process. But a child *in venter sa mere* (in its mother's womb) is not a subject of homicide, unless, subsequently to the injury, it be born alive, and die, within a year and a day from its birth, from the injury received whilst unborn.

Criminal Homicide is one of three kinds, murder, manslaughter, and self-murder, or suicide.

I. Murder is committed by—
1. Voluntary homicide, without circumstances of justification, excuse, or extenuation.
2. Involuntary homicide, resulting from the commission of a felony, or from an attempt to commit felony.
3. Homicide, whether voluntary or involuntary, committed in unlawfully resisting officers or ministers of the law, or other persons lawfully acting for the advancement or in the execution of the law.

II. Manslaughter consists in :—
1. Voluntary but extenuated homicide, committed in a state of provocation, arising from a sufficient cause.
2. Involuntary homicide, not excused as being occasioned by mere misadventure.

This second class may be subdivided into :—
1. Involuntary homicide, resulting from some act done, or from the wilful omission to do some act, with intent to occasion bodily harm.
2. Involuntary homicide, resulting from some wrongful act done to the person.
3. Involuntary homicide, in committing, or in attempting to commit, an offence attended with risk of injury to the person.
4. Involuntary homicide, resulting from some act done without due caution, or from the unlawful omission to do some act.

Homicide not Criminal is—
1. Justifiable, as done for the advancement or in the execution of the law; or
2. Excusable, as done for the defence of person or property; or because it has, without the fault of the party, become necessary for his preservation.

The offence is extenuated where the act, being done under the influence of sudden provocation, or of fear, or of alarm, which may, for the time, suspend or weaken the power of judgment and self-control, is attributable to transport of passion or defect of judgment so occasioned, without any deliberate intention to kill or do great bodily harm; regard still being had to the nature and extent of violence used by the party inflicting the injury which causes death, as compared with the cause of provocation. The offence is not extenuated where the cause of provocation is slight, and the killing cannot be attributed to mere heat of blood arising from the provocation given.

Homicide is neither justified nor extenuated by reason of any consent given by the party killed, as in duels.

The statute of 9 Geo. IV. c. 31, s. 3, enacts, that every person convicted of murder, or of being accessory before the fact to murder, shall suffer death; and that every accessory after the fact to

murder shall be liable, at the discretion of the court, to be transported for life, or to be imprisoned, with or without hard labour, for any term not exceeding four years. By the 25 Geo. II. c. 37, the bodies of persons executed for murder were directed to be delivered to surgeons to be dissected, or to be hanged in chains. The 2 & 3 Wm. IV. c. 75, required that such persons should be hung in chains, or buried within the precincts of the prison. The 4 & 5 Wm. IV. c. 36, s. 1, has taken away one part of the alternative, and the mode of burial is the only circumstance which distinguishes sentence upon a conviction for murder from those pronounced in other capital cases.

The offence of manslaughter is punishable with transportation for life, or for not less than seven years, or with imprisonment with or without hard labour, not exceeding four years, with fine, by 9 Geo. IV. c. 31, s. 9.

MURE, SIR WILLIAM, of Rowallan, in the county of Ayr, was born about 1594. Of the poet's early life few memorials have been preserved. Before his twentieth year he attempted a version of the classic story of Dido and Æneas; and in 1617, he addressed James I. at Hamilton, on his progress through the country, in a poetical piece which is embodied in the collection entitled 'The Muse's Welcome.'

During the civil war, Sir William took the popular side, and in the first army raised against the king, he commanded a company of the Ayrshire regiment. He was a member of the convention in 1643. He was wounded in the battle of Marston Moor; and in the succeding month he was engaged at the storming of Newcastle. He died in 1657.

By far the greater portion of Sir William's writings remain in manuscript. Specimens of his compositions however may be found in a volume entitled 'Ancient Ballads and Songs, chiefly from Tradition, Manuscripts, and Scarce Works, with Biographical and Illustrative Notices, including Original Poetry, by Thomas Lyle,' London, 1827.

MURET. [Garonne, Haute.]

MURET, MARC ANTOINE FRANÇOIS (MURE'TUS in the Latinised form of his name), was born near Limoges in 1526. He learnt Greek and Latin, and at the age of 18 gave lectures on Cicero and Terence in the College of Auch. He afterwards went to Paris, where he taught philosophy and civil law in the College of Sainte-Barbe with great success. He entered into holy orders, obtained several benefices, and was appointed professor of philosophy, and afterwards of civil law at Rome. He died at Rome in 1585. His principal works are—'Commentarius de Origine Juris;' 'Commentarius de Legibus, Senatusque Consultis, et Longa Consuetudine;' 'Commentarius in Titulos ad Materiam Jurisdictionis pertinentes;' 'Notæ in Justiniani Institutiones;' 'Orationes.' His commentaries and scholia upon Aristotle's 'Ethics and Rhetoric,' on Plato's 'Republic,' on Cicero's 'Catilinariæ' and 'Philippicæ,' on Seneca's 'Epistles,' on Sallust and Tacitus, on Terentius, Catullus, and Horatius, are valuable, as well as his nineteen books 'Variarum Lectionum' of different classical authors.

MURIATIC ACID. [Chlorine.]

MU'RIDÆ, an extensive group of small animals, which, from their prodigious multiplication and the destructive influence they exert over vegetation, force themselves upon the notice of man.

The arrangement of the order *Rodentia*, which includes the *Muridæ*, is confessedly a work of difficulty, and different writers have arrived at very opposite results in this respect, as may be seen by comparing their respective systems. Among those who have devoted their attention to the Rodents we may mention Cuvier ('Règne Animal'), Gray ('Annals of Philosophy,' 1825), Dr. Fisher ('Conspectus Ordinum et Generum,' 1829), Swainson ('Classification of Quadrupeds,' 1835), A. Wagner (Wiegmann's 'Archiv für Naturgeschichte,' 1841), and Waterhouse ('Magazine of Natural History,' New Series).

This latter author deduces his characters from the skull and the form of the jaws, portions of the skeleton not only in themselves most important but presenting modifications which strongly point out the affinities of the genera. Cuvier indeed in his 'Ossemens Fossils,' had previously remarked that 'the skeletons of the Rodentia are so variable owing to the diversity of the movements of the species of different genera, and to the presence or absence of clavicles, that it is difficult to find any characters in common unless it be in the bones of the skull.' Hence the importance of every structural phase in this part of the frame, especially when the constancy of the characters thus afforded is taken into consideration.

Thus guided, Mr. Waterhouse divides the Rodents into three great sections, viz. 1, *Murina*, 2, *Hystricina*, 3, *Leporina*.

The section *Murina* contains the following families and genera:—

Fam. I. *Sciuridæ*. Genera, *Sciurus*, *Pteromys*, *Sciuropterus*, *Xerus*, *Tamias*, *Spermophilus*, and *Arctomys*.

Fam. II. *Myoxidæ*. Genera, *Myoxus*, *Eliomys*, *Muscardinus*, and *Graphiurus*.

Fam. III. *Dispodidæ*. Genera, *Dipus*, *Alactaga*, and *Meriones*.

Fam. IV. *Muridæ*. Genera, *Gerbillus*, *Psammomys*, *Mus*, *Hesperomys*, *Dendromys*, *Phlœomys*, *Cricetomys*, *Cricetus*, *Euryotis*, *Hapalotis*, *Reithrodon*, *Sigmodon*, and *Neotoma*.

Subfamily 1. *Aspalomyina*. Genera, *Rhizomys*, *Aspalomys*, and *Heterocephalus*.

Subfamily 2. *Arvicolina*. Genera, *Ondatra*, *Arvicola*, and *Lemmus*.

Our observations on the Squirrels (Genera *Sciurus*, *Pteromys*, &c.) are given under the head Squirrels.

The Marmots decidedly form a portion of the family *Sciuridæ*; there is a transition to them through the ground-squirrels (*Tamias*), and the genus *Spermophilus*. The common ground-squirrel (*Tamias striatus*) is a native of the north-eastern parts of Europe and the north of Asia. It lives in burrows, although it climbs trees with facility. In this genus the species are furnished with cheek pouches, as they are also in Spermophilus, of which genus we may notice Parry's Marmot (*Sp*

Parryi). This species is common in the high latitudes of North America, and is well described by Dr. Richardson in the 'Fauna Boreali-Americana.' Of the true marmots, the Alpine Marmot (*Arctomys Marmota*) and the Quebec Marmot (*A. Empetra*) may be taken as examples. In the genus *Arctomys* cheek-pouches are wanting, or very rudimentary.

The genus *Anomalurus* is founded on a singular species brought by Mr. Fraser, naturalist to the Niger Expedition. ('Proceedings of the Zoological Society,' Sept. 1842.)

The genus *Aplodontia* is related to the burrowing squirrels. *Ascomys* is isolated, and forms the type of a subfamily, and in this predicament stands *Castor*. [BEAVER.] Most naturalists regard the latter as belonging to the *Arvicolidæ*.

The family *Myoxidæ* is illustrated by our common Dormouse (*Myoxus avellanarius*), *Muscardin* of the French, *Moscardino* of the Italians, *Liron* of the Spanish, *Rothe Wald-Maus* and *Hasel-Maus* of the Germans. For a description of this beautiful little nocturnal rodent, see Bell's 'British Quadrupeds,' also the 'Museum of Animated Nature,' vol. i. p. 55.

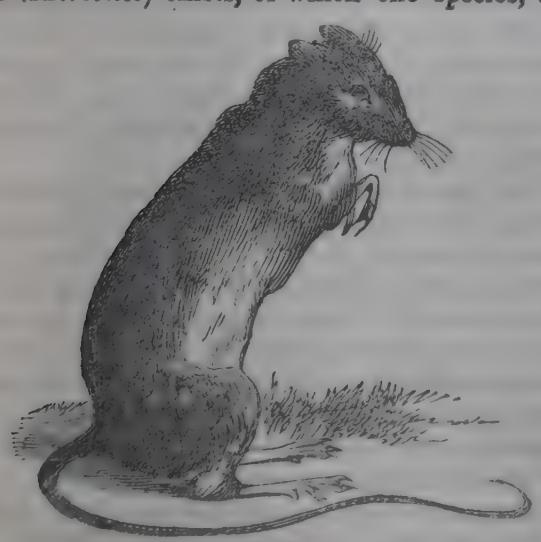
As an example of the genus *Graphiurus*, we may notice the *G. Capensis*, from Southern Africa. (Dr. Smith's 'Zoology of Southern Africa.')

The family *Dipodidæ* comprises the Gerboas or Jerboas (*Dipus*), the Alactagas (*Alactaga*), and the Jumping Mice (*Meriones*) of North America.

In the true Gerboas the fore limbs are extremely short, and the tarsi of the hind limbs greatly elongated; the three hind toes (on each foot), protected underneath by a bush of stiff hair, are united to a single canon-bone. These active bird-like little animals are natives of the sandy deserts of Asia and Egypt: they are nocturnal, burrowing, and frugivorous. Example.—The Egyptian Gerboa (*Dipus Ægyptius*). Consult Lichtenstein's Monograph of the genus *Dipus*, and F. Cuvier's paper in 'Trans. Zool. Soc.,' vol. ii.

The Alactagas have five hind toes, of which the middle three are united to a single metatarsal bone, but the two external rudimentary toes have each their little metatarsal bone. Example.—*Alactaga arundinis*. Locality, Barbary.

In North America a race of little Jumping Mice (*Meriones*) exists, of which one species, the Labrador Jumping Mouse (*M. Labradorius*), is described by Richardson in the 'Fauna Boreali-Americana;' it was however known to Pennant and the writers subsequent to his time.



Labrador Jumping Mouse (*Mus Labradorius*).

This elegant little animal is common in the Fur Countries as far north as the Great Slave Lake, and perhaps farther; but Dr. Richardson was not able to gain any precise information respecting its habits.

It is probably to this family that we must refer the Cape Jumping Hare of South Africa (*Pedetes Capensis*), the *Grand Gerbo* of Allemand, the *Spring-Has* of the Dutch, and the *Dipus Cafer* of Gmelin, &c. This species is burrowing and nocturnal in its habits. It can spring, kangaroo-like, upwards of 20 feet at a bound. Length from nose to tail about 1 foot 2 inches, of the tail near 15 inches.

Mr. Ogilby describes a species of Dipus from the central downs of Australia, which he names after its discoverer, Sir Thomas Mitchell, viz. *Dipus Mitchellii*. See 'Linn. Trans.,' vol. xviii. This species belongs to the genus *Hapalotis*, and is not a true Gerboa, but represents them in Australia.

So numerous is the family *Muridæ* in genera, and so interminable in species, that its analyzation is here out of the question. A few examples may suffice to illustrate this assemblage of animals commonly called Rats and Mice.

Among these must be ranked the Gerbilles (*Gerbillus*), little nocturnal burrowing animals very similar in their habits to the Gerboas. They are natives of Africa and India, tenanting plains and sandy districts; and are very quick and active, leaping with great agility. Though the Gerbilles have the posterior limbs developed, their development is by no means to the same extent as in the Gerboas, and there is a far more equal proportion between them and the anterior pair: hence these animals run as well as leap. They hoard up grain in their burrows, and sit up while eating, like a squirrel. Example, *Gerbillus Burtoni*, F. Cuvier. ('Trans. Zool. Soc.' vol. ii.)

As examples of the genus *Mus*, we may mention the Black Rat (*Mus Rattus*) now rare, the Common Brown Rat (*Mus decumanus*, Pall.), and the Common Mouse (*Mus musculus*, Linn.).

To this genus belongs the Long-Tailed Field-Mouse (*Mus sylvaticus*), an elegant little animal, the ravages of which, at certain times and in various districts, render it injurious to man. One of the most efficient agents of its destruction is the Short-Eared Owl (*Otis ulula*).

The Harvest Mouse (*Mus messorius*, Shaw,) is a beautiful creature, the smallest of British quadrupeds, and appears to have been first noticed by White of Selborne, who thus introduces his discovery to Pennant. 'I have procured some of the mice mentioned in my former letter, a young one and a female with young, both of which I have preserved in brandy. From the colour, size, shape, and manner of nesting, I make no doubt but that the species is nondescript. They are much smaller and more slender than the *Mus domesticus medius* of Ray, and have more of the squirrel or dormouse colour; their belly is white;

a straight line along their sides divides the shades of their back and belly. They never enter into houses; are carried into ricks and barns with the sheaves, abound in harvest, and build their nests amidst the straws of the corn above the ground, and sometimes in thistles. They breed as many as eight at a litter, in a little round nest composed of the blades of grass or wheat. One of these I procured this autumn most artificially platted, and composed of the blades of wheat, perfectly round, and about the size of a cricket-ball; with the aperture so ingeniously closed, that there was no discovering to what part it belonged. It was so compact and well fitted that it would roll across the table without being decomposed, though it contained eight little mice that were naked and blind. As this nest was perfectly full, how could the dam come at her litter respectively so as to administer a teat to each? Perhaps she opens different places for that purpose, adjusting them again when the business is over; but she could not possibly be contained herself in the ball with her young, which moreover would be daily increasing in bulk. This wonderful procreant cradle, an elegant instance of the efforts of instinct, was found in a wheat-field suspended in the head of a thistle.' And again: 'As to the small mice, I have further to remark, that though they hang their nests for breeding up amidst the straws of the standing corn above the ground, yet I find that, in the winter, they burrow deep in the earth, and make warm beds of grass; but their grand rendezvous seems to be in corn-ricks, into which they are carried at harvest. A neighbour housed an oat-rick lately, under the thatch of which were assembled near an hundred, most of which were taken, and some I saw. I measured them, and found that from nose to tail they were just two inches and a quarter, and their tails just two inches long. Two of them, in a scale, weighed down just one copper half-penny, which is about the third of an ounce avoirdupois; so that I suppose they are the smallest quadrupeds in this island. A full-grown *Mus medius domesticus* weighs, I find, one ounce lumping weight, which is more than six times as much as the mouse above; and measures from nose to rump four inches and a quarter, and the same in its tail.'

Harvest Mouse (*Mus messorius*).

Besides grain, this little mouse feeds upon flies and other insects, worms, &c.

The Barbary Mouse (*Mus Barbarus*) is a very beautiful example of the present genus, from its yellow longitudinal stripings on a dark brown ground. This species is common in Barbary.

Examples of the genus *Mus* abound in the New World. Mr. Waterhouse in the 'Zoology of Her Majesty's Ship Beagle,' describes the collection procured by C. Darwin, Esq., at Coquimbo, Valparaiso, Maldonado, Bahia Blanca, &c., amounting to about thirty-one distinct species.

The genus *Cricetus* is represented by the Hamster. Passing to the subfamily *Aspalomyina*, we may remark that it is represented by the Blind Rat of Shaw (*Aspolomys Typhlus*, Laxmann, *Aspalax Typhlus*, Desmarest, *Spalax Typhlus*, Illiger). In this species the eyes are rudimentary and hid beneath the skin; there are no external ears, no tail; the limbs are very short. This species burrows extensively beneath the turf, driving at intervals lateral passages in its search for roots. Openings to the surface occur at distances of some yards from each other, and there the earth is raised into hillocks, sometimes of two yards in circumference, and of considerable height. It works stoutly and rapidly, and on the approach of an enemy instantly digs a perpendicular burrow. Though it cannot see, it lifts its head in a menacing attitude towards its assailant, and, when irritated, snorts and gnashes its teeth, but emits no cry: its bite is very severe. In the morning it often quits its hole, and during the season of love basks in the sun with the female.

The subfamily *Arvicolina* is represented by the *Ondatra*, or Musquash, (Richardson's 'Fauna Boreali-Americana,') the Voles (*Arvicola*), as the Water-Rat, the Short-Tailed Field Mouse, the Bank Vole (*A. pratensis*), &c. (Bell's 'British Quadrupeds'). To these animals the Lemmings (*Lemmus*) are closely allied; small rodents, which, in the northern regions of Europe and Asia, often swarm in countless myriads, and, migrating from one district to another, devastate the country as they pursue their way, moving on like an army of locusts. Nothing stops their progress; they swim over lakes or rivers, and leave desolation in their track. Beasts and birds of prey are their close attendants, and thin their ranks, until at length, of the hordes which migrated from their northern home, no survivor lives to return. (See Pennant.)

The section *Hystricina* contains the following genera, viz. *Bathyergus*, *Pœphagomys*, *Octodon*, *Abrocoma*, *Myopotamus*, *Capromys*, *Echimys*, *Aulocodus*, *Hystrix*, *Dasyprocta*, *Chinchilla*, *Cavia*, and *Hydrochœrus*.

The genus *Bathyergus* (*Orycterus*, F. Cuvier) contains the burrowing Sand-Rats of South Africa. One species (*B. maritimus*) is abundant in the sand-flats of the Cape of Good Hope, and the foot of the traveller often sinks into their galleries. It is dangerous to ride on horseback in such places, especially if the horse be urged beyond a walking pace, as the animal is liable to sink unexpectedly to the depth of a foot or more into one of these treacherous mines.

The genus *Capromys* contains, as far as known, only one species (*C. Furnieri*, Desm., *Isodon pilorides*, Say), a native of Cuba, where it is called

the *Utia*. (For anatomy see 'Zool. Proc.' for 1832 and 1835.) Size of a small rabbit; partially arboreal, diet solely vegetable; plantigrade; fur coarse.

Utia (*Capromys Furnieri*).

The genus *Octodon* forms the type of a family (*Octodontidæ*) embracing, besides *Octodon*, the genera, *Ctenomys Pæphagomys* and *Abrocoma*. Locality, South America.

Of the genus *Octodon* (*Dendrobius*, Meyer) we select as an example the *Octodon Cumingii* of Bennett. Locality, Chili.

'These little animals are exceedingly numerous in the central parts of Chili. They frequent by hundreds the hedge-rows and thickets, where they make burrows close together leading one into another. They feed by day in a fearless manner, and are destructive to fields of young corn. When disturbed they all run together towards their burrows, in the same manner that rabbits do in England when feeding outside a cover. When running they carry their tails high up, more like squirrels than rats, and they often remain seated on their haunches like the former animals. According to Molina they lay up a store of food for winter, but do not become dormant. The Octodon is the Degu of that author; he says that the Indians in past times used to eat them with much relish. These animals appear to be very subject to be piebald and albinos, as if partly under the influence of domestication.' ('Voyage of His Majesty's Ship Beagle.'

Octodon Cumingii.

The section *Leporina* contains the Hares (*Lepus*) and the Calling Hares (*Lagomys*). [LEPORIDÆ.]

Fossil Muridæ.—The bones of various species of small Rodentia are found in bone-caverns in the gypsum of Montmartre, and in various tertiary formations, both in the Old and New World.

MURILLO, BARTOLOMEO ESTEBAN, was born at Seville, in 1618. He made rapid progress in painting under his uncle, Juan del Castillo, an artist of merit; and afterwards, by painting several small pictures of saints, obtained sufficient money to enable him in 1643 to go to Madrid. Here he received instruction from Velasquez, and carefully studied the specimens of the Italian painters then in the royal collection at Madrid. Returning to Seville in 1645, he excited great admiration by his paintings in the convent of St. Francis, and his execution of several historical works for the King of Spain. Amongst various altar-pieces which he subsequently painted for the churches and convents in Madrid, Seville, Cordova, Cadiz, and Granada, is an altar-piece representing the 'Marriage of St.-Catherine,' for the Capuchin convent at Cadiz. It was during the execution of this work that he met with an accident on the scaffolding which caused his death, at Seville, April 3, 1685.

Among the finest pictures of Murillo are 'Moses striking the Rock,' and 'Christ feeding the Five Thousand,' in the convent of St. Francis, at Seville; and 'St. Antony of Padua,' in the cathedral of that city. The Dresden Gallery has a fine 'Virgin and Child' by his hand. The picture which Murillo preferred to all his other works was that of 'St. Thomas de Villa Nueva distributing Alms to the Sick and the Poor.'

MURPHY, ARTHUR, was born near Elphin, Roscommon, Ireland, Dec. 27, 1730. His father was a merchant in Dublin. In 1740, he entered the college of St. Omer, where he remained nearly 7 years, and, on his return home, passed 2 years in a merchant's counting-house at Cork. Thence he came to London, and in a short time commenced his career as a public writer. On Oct. 21, 1752, he started 'The Gray's Inn Journal,' which he carried on to Oct. 12, 1754. He then appeared on the stage, with no great success, for two seasons; after which he entered himself at Lincoln's Inn, was subsequently called to the bar, appointed a commissioner of bankrupts, and died at Knightsbridge, June 18, 1805. His principal works were a diffuse translation of Tacitus, the lives of Fielding, Johnson, and Garrick, and about 20 dramatic pieces, of which two of the best are 'The Way to Keep Him,' and 'Three Weeks after Marriage.'

MURPHY, ROBERT, was the son of a shoemaker, parish clerk of Mallow in Ireland: he was born in 1806. His father intended to have brought him up to his own trade; but the son's destination was changed by an accident which nearly cost him his life. When eleven years of age, while playing in the streets of his native town, he was run over by a cart, and lay on his bed for twelve months with a fractured thigh-bone. During this confinement his family supplied him with such

books and newspapers as they could procure; and among them there happened to be a Cork almanac, containing some mathematical problems. These attracted the child's attention, and made him desirous of possessing Euclid and a work on algebra. The books were procured with some difficulty, and before he was again able to walk, and before he was thirteen years of age, young Murphy was an extraordinary instance of a self-taught mathematician.

When he was seventeen years old Mr. Mackey, a Roman Catholic priest, published a duplication of the cube, the plausibility of which attracted attention, and, it is said, even obtained the assent of the teachers at Maynooth. Young Murphy, then eighteen years of age, answered this duplication in a pamphlet, entitled 'Refutation of a pamphlet written by the Rev. John Mackey, R. C. P., entitled "A method of making a Cube double of a Cube, founded on the Principles of Elementary Geometry," wherein his Principles are proved erroneous, and the required Solution not yet obtained; by Robert Murphy,' Mallow, 1824. The matter and style of this production are really extraordinary under the circumstances.

Mr. Murphy was sent to Cambridge in 1825, took his degree, and was elected fellow of his college (Caius) in 1829.

He gradually fell into dissipated habits, and in December, 1832, left Cambridge, with his fellowship under sequestration for the benefit of his creditors. There is much excuse for a very young man, brought up in penury, and pushed by the force of an early talent into a situation in which ample command of money is accompanied by even more than proportionate exposure to temptation. His college admitted the excuse to its fullest extent: and though it could not tolerate the continued residence of an officer who had shown such an example, yet it was understood that his ultimate promotion to one of the more valuable fellowships would take place, on the amendment of his excesses. After living some time among his friends in Ireland, he came to London in 1836, to begin life again as a teacher and writer. Among other things, he obtained from the Useful Knowledge Society an engagement to write his work on the Theory of Equations. In October, 1838, he obtained a small permanent income by his election to the examinership in Mathematics and Natural Philosophy in the University of London; but, burdened as he was with debt, this was rather an addition to the instalments of his creditors than an increase of his own means of comfort. He submitted with resignation to the effects of his own misconduct, and showed himself most willing to make every exertion, though well knowing that many years must elapse before he could, by any effort, redeem the ground he had lost. He died March 12, 1843, of a disease of the lungs. For a list of his writings and more details on his life, see the 'Penny Cyclopædia.'

Mr. Murphy's character as a mathematician is too well known to require any comment of ours. What he might have been if the promise of his boyhood had not been destroyed by the unfortunate circumstances of his life it is difficult to say; for he had a true genius for mathematical invention. Before however he had more than commenced his career, his departure from Cambridge, and the necessity of struggling for a livelihood, made it impossible for him to give his undivided attention to researches which, above all others, demand both peace of mind and undisturbed leisure.

MURRAY, JAMES STUART, EARL OF, known in Scottish history by the name of the 'Good Regent,' was the eldest son of three illegitimate brothers, children of King James V. His mother was Lady Margaret, daughter of John lord Erskine of Mar. He is supposed to have been born about 1533. When but a few years old his father made him prior of St. Andrews; but in the religious struggles which divided Scotland he joined the reformers, among whom he acquired a very high degree of consideration. When, in the end of the year 1559, the congregation resolved on taking the government into their own hands, he was one of the council appointed for civil affairs. On the death of the queen regent, by whom he was opposed, he was made one of the lords of the articles; and on the dauphin's death was directed by the convention of estates to proceed to France and invite Mary to return to her native country. He was successful in his mission, having triumphed over all the plans of the Catholic party. He returned to Edinburgh early in June 1561. On Mary's arrival Murray became her prime minister, confidant, and adviser. In this situation he acted with great tact and judgment. He protected the queen in the exercise of her own religion, and in return obtained from her a proclamation highly favourable to the reformers. Mary rewarded his services by conferring on him the title of Earl of Mar. This title, however, having been claimed by Lord Erskine, was soon after resigned, and he was created Earl of Murray. His rival, the Roman Catholic Earl of Huntley, having died, Murray was left in undisputed possession of the chief authority in the kingdom next to the queen. His tolerance however excited the jealousy of the reformers, and caused a breach between him and Knox. The queen's marriage with Darnley seems to have brought them together again; while it occasioned the subsequent estrangement between Murray and the queen. To this marriage Murray, Knox, and Queen Elizabeth, and their respective followers, were all opposed. Murray was not accessory however to Darnley's murder; though he knew of its being intended, and left Edinburgh abruptly on the morning of Sunday, February 9, 1567, and not long afterwards left the country, remaining abroad till a few days after the coronation of the young prince James. He had not in the mean time been ignorant of what was going on: Cecil was in constant communication with him; and soon after the queen's surrender of herself to 'the prince's lords' at Carberry Hill, he sent an agent into Scotland to attend to his interests.

On Aug. 22, 1567, he was proclaimed regent, and immediately proceeded to establish himself in the government. He now held the situation

even against the queen herself; taking the field against her at Langside, where she sustained a complete defeat. He also gave evidence against her at her trial. But while passing through the streets of Linlithgow, Jan. 23, 1570, he was shot through the body by James Hamilton of Bothwellhaugh, nephew to the archbishop of St. Andrews, in revenge for some personal injury committed by the regent years before. Murray survived till midnight, when he died in the 38th year of his age.

MURRAY, SIR ROBERT, son of Sir Robert Murray of Craigie, in Scotland, entered in early life into the French service, where he obtained the rank of colonel. He returned to Scotland when the difficulties of King Charles I. were beginning to assume their most alarming aspect; and at Newcastle he had a design for the king's escape, which seems to have been frustrated only by Charles's want of resolution.

On the fall of the royal cause he appears to have gone again to France. At the Restoration his appointments as a lord of session and justice-clerk, which had been previously conferred upon him by Prince Charles, were renewed. He was then also made one of the lords-auditors of exchequer. Murray was the father of the Royal Society of London. That body had existed as a debating club previous to the time of the Commonwealth, when its members were dispersed. At the Restoration the Society assembled again, when its objects were extended, and Sir Robert Murray became its first president. Sir Robert died suddenly in the month of June, 1673.

MURRAY, WILLIAM. [MANSFIELD, EARL OF.]

MURRAY, PATRICK, fifth LORD ELIBANK, eldest son of Alexander, fourth lord, was born in February, 1703; and on June 22, 1723, he passed advocate. He did not prosecute the profession however, but entered the army; and in 1740 we find him a lieutenant-colonel in the expedition to Carthagena, of which expedition he wrote an account, which remains in manuscript in the library of the Board of Trade. In 1758 he published 'Thoughts on Money, Circulation, and Paper Currency;' and soon afterwards an 'Inquiry into the Origin and Consequence of the Public Debt.' In 1765 he published 'Queries relating to the proposed Plan for altering entails in Scotland;' and in 1773, a 'Letter to Lord Hailes on his Remarks on the History of Scotland.' In 1774 he published some 'Considerations on the present state of the Peerage of Scotland.' In political life he was an opposition lord; and is now known to have maintained a correspondence with the exiled house of Stuart. Lord Elibank died without issue August 3, 1778.

MURRAY, LINDLEY, was born in 1745, at Swetara, near Lancaster, in the state of Pennsylvania, North America. In 1753 his father, who was a merchant, removed to New York, and at an early age Lindley Murray was placed in his father's counting-house, but disliking mercantile pursuits he prevailed on his father to have him instructed in classics and the law. About the age of 21 he was called to the bar, and obtained a good practice. He however afterwards entered into the mercantile profession, with such success, that about the time of the establishment of American independence he had acquired sufficient property to allow him to retire from business. Ill health induced him to try the climate of England. He purchased a house and garden at Holgate, about a mile from the city of York, where he resided during the remainder of his life. His first work, 'The Power of Religion on the Mind,' was published anonymously in 1787. The first edition of his 'English Grammar' was brought out in 1795. A second edition was revised and enlarged by the author, and then reprinted. 'Exercises,' to correspond with the Grammar, and a 'Key' to the Exercises, were published in 1797, in which year he also published an Abridgment of the Grammar for the use of beginners. The sale of each of the works has been very large, and still continues to be so. Lindley Murray published several other works, which, though they have not retained the popularity of his Grammars, had considerable success at the time. For the copyright of these works he received a liberal price, and the entire sum was devoted to charitable purposes. He died Feb. 16, 1826.

MURRAY, DR. ALEXANDER, was born at Dunkitterick, in the stewartry of Kirkcudbright, Oct. 22, 1775. His father was a farm servant, and had a numerous family, who were all shepherds or pastoral farm servants. Alexander had reached his sixth year before he was taught the alphabet. His first instructor was his father, who drew for his son the figures of the letters on the board of an old wool-card with the black end of a burned heather-stem. In 1783 young Murray's reading and memory had become the wonder of the rustic circle in which he lived; and happening to attract the notice of an uncle, he was by him sent to school at New Galloway. He remained there from Whitsuntide, 1784, till the beginning of November, when he was seized with an illness which obliged him to be taken home. Here, so soon as his health got a little better, he was put to his old employment of a herd, with the rest of the family; and this course of life now continued for about three years. During all that time he spent every penny which he procured from friends or strangers in the purchase of books and ballads. In the winter of 1787 he was engaged by the heads of two families in a neighbouring parish to teach their children. He returned home in March 1788, and with part of his fees, which were 15*s.* or 16*s.*, he bought books of history and arithmetic. At Martinmas, 1789, he was engaged by three families in the moors of Kells and Minnigaff to teach their children; and during that winter he migrated about, remaining six weeks in one family at a time, the families living at considerable distances from each other. He returned home a little before Whit-Sunday, 1790, and was enabled to attend a school at Minnigaff. He borrowed a French grammar, and set to learning the language so hard that in less than a fortnight he could read portions of the 'Diable Boiteux.' He next borrowed a 'Latin Rudiments;' and with a little help from the

master, before the vacation in August he beat a class of scholars who had been a considerable time at the study. At Martinmas he went to teach in a family reading, writing, arithmetic, and Latin.

On Whit-Sunday, 1791, he returned to school, and finding a schoolfellow in possession of a Greek grammar, he commenced that language, after spending part of his winter's wages in the purchase of a grammar and lexicon. He had also by this time mastered the Hebrew alphabet. He determined on learning that language also, and accordingly procured the first edition of Robertson's 'Grammar,' which, over and above the Hebrew, contained the Arabic alphabet, to which Murray next applied. At Martinmas of the above year he was again engaged to teach, but at the increased fee of 35*s.* or 40*s.*, and in this situation he devoted every spare moment to French, Latin, Greek, and Hebrew. In summer he was again at school, and again, in the winter, teaching in a family which he chose for its convenience to a school which he wished to attend in the winter evenings. In this school he got hold of Bailey's 'English Dictionary,' which introduced him to the Anglo-Saxon language. He proceeded in this way, taking advantage of every circumstance to increase his knowledge of languages. In November, 1794, he came to Edinburgh, and in the course of two years he obtained a bursary, or exhibition to the university of Edinburgh. By the advice of his friends he prosecuted the studies necessary for the Church; and at length, in Dec., 1806, he was appointed assistant and successor to Dr. Muirhead, minister of Urr, in the stewartry of Kirkcudbright, a charge to which he in 1808 succeeded as full stipendiary, but still continued his philological pursuits. In 1811 he was applied to by the Marquis Wellesley, as the only person in the British dominions qualified to translate a letter written in Geez, from the government of Tigré to his Britannic Majesty; and he performed the task in the most satisfactory way. The following year he was appointed to the chair of Oriental languages in the university of Edinburgh. The university, a few days after his election, conferred on him the degree of Doctor in Divinity. Soon after he published, for the use of his students, a small work, entitled 'Outlines of Oriental Philology.' He continued to teach his class with little interruption till early in 1813. The pulmonary complaint however, with which he had been struggling through the winter, at length compelled him to suspend his prelections; but he pursued his favourite studies till within a few days of his death, which took place April 15, 1813.

His principal work, which was posthumous, appeared under the auspices of the Rev. Dr. Scott of Corstorphine, and is entitled a 'History of the European Languages, or Researches into the Affinities of the Teutonic, Greek, Celtic, Sclavonic, and Indian Nations.'

MURRAY, JOHN, publisher, born Nov. 27, 1778, died June 27, 1843. His father, whose name was MacMurray, purchased (1768) the business of Paul Sandby, 32, Fleet Street. While at school at Gosport, under Dr. Burney, John Murray lost the sight of an eye through an accident with a penknife. He commenced business as a medical bookseller, in partnership with Mr. Highley, but having dissolved the partnership in 1803, he soon opened a wider field of literary business. In 1807 he formed the plan of the 'Quarterly Review,' which he communicated to Mr. George Canning, and subsequently to Sir Walter (then Mr.) Scott, by the co-operation of whom, and the assistance of their friends, the publication was commenced in 1809, and was highly successful.

In 1810 he made the acquaintance of Lord Byron, giving 600*l.* for the first two cantos of 'Childe Harold.' In 1812 he removed to Albemarle Street, where, increasing the number of his friends and literary connections, he soon surrounded himself with a circle of distinguished literary characters. In 1826 he commenced 'The Representative,' a daily newspaper—almost the sole undertaking of his life which proved a failure. It was attended with considerable loss, which fell entirely on him, and was soon given up. Among his valuable and successful publications were the expeditions of Mungo Park, Belzoni, Parry, Franklin, Denham and Clapperton—the Family Library, begun April 1829—the Domestic Cookery, and various others.

Mr. Murray married in 1807 the daughter of Charles Elliot, bookseller, of Edinburgh, by whom he left one son and three daughters.

MURRHINE (sometimes written *Myrrhine*) VASES, vessels used by the ancients, were made of the stone or hard substance, whatever it might be, termed *murrha* (*μύρρα*). They are frequently noticed by the classic writers, and usually described as transparent, though sometimes spotted or clouded, like our cups of agate. Pliny speaks of them as coming from the East, from Parthia and Carmania. He adds that they were first brought to Rome by Cn. Pompeius after his victory over Mithridates.

MUS. [MURIDÆ.]

MUSA, ANTONIUS, was a physician of some celebrity at Rome. He was at one time the medical attendant of the Emperor Augustus, whose slave he had formerly been; and he gained a great reputation by successfully prescribing cold affusions for the emperor to relieve arthritic pains, in opposition to Æmilius. He prescribed a similar remedy for Horatius (Epist. i. 15).

MU'SA, IBN NOSSEYR, Governor of Mauritania, was born in the year 19 of the Flight (A.D. 640). He seems to have made his first campaigns under his father Nosseyr, commander of the Khalif Muawiyah's body guard, and to have been present at almost all the battles then fought by the Moslems. His bravery and military talents made him a favourite with 'Abd-el-'azíz Ibn Merwan a prince of the royal family, then governor of Egypt, who appointed him general of the armies in Africa, in the year 79 of the Flight (A.D. 698–9). Músa seems to have achieved nothing brilliant until the year 88 (A.D. 707), when the khalif Al-walid named him governor of Mauritania, with instructions to complete the conquest of the country.

Múza took his departure from Egypt at the head of a numerous army, and reduced to obedience the tribes of the northern shores of Africa. Tangiers, Arsilla, and Ceuta, were speedily reduced; the islands of Sicily, Sardinia, and Mallorca were ravaged; and in the year 91 of the Flight (A.D. 709) the whole of Northern Africa, from the Pillars of Hercules to the delta of Egypt, acknowledged the laws of the conqueror.

At this critical moment Spain being torn by civil wars, Múza was invited by Eba and Sisebuto, the sons of the late king Wittiza, to invade Spain, and restore them to their rights. Múza despatched Tárik to Spain, who made brilliant conquests, and against his master's orders pushed on to and took Toledo. Múza, elated at the successes, but indignant at the disobedience of his lieutenant, speedily landed in Spain with 18,000 men, reduced Seville, Carmona, and Merida, and marched to Toledo, where he publicly reproached Tárik for his disobedience, confiscated his property, and ordered him to be beaten with rods and cast into prison. But Tárik was speedily released, and restored to his military command. He was ordered to proceed eastward, to subdue the neighbouring provinces and lay siege to Saragossa. Múza took a northern direction, reduced Salamanca, and then, jointly with Tárik, took Saragossa in July 713. Thence Tárik made a brilliant campaign in Valencia, while Múza marched towards the Pyrenées, reducing the cities of Calahorra, Lerida, and Barcelona by the way, and, crossing the mountain barrier, entered France. No mention is made by Christian historians of his proceedings in the French territory; it is therefore probable that his invasion was without any important results. On his return from this expedition, a messenger from the khalif Al-walid, summoned him, together with Tárik, to the royal presence.

Tárik hastened to obey the orders of the khalif; but Múza, who, if faith can be placed in the Arabian writers, had conceived the project of subduing Gaul, Italy, and Germany, and forcing his way from Spain to Constantinople, refused to comply with the summons. He directed his course towards Asturias and Gallicia, which the Moslems had not yet visited. But the khalif, in anger at Múza's disobedience, sent a second messenger, who reached him at Lugo, in Gallicia, caught the bridle of his horse, and, in presence of the army, commanded him to repair to Damascus. Múza did not venture again to disobey the order of the khalif, and, intrusting the government of Spain to his son Abdulaziz, commenced his journey, in March 714.

Múza proceeded to Syria with a numerous and richly laden escort, besides being followed by thousands of captives, among whom were 400 Gothic nobles, sumptuously arrayed. He did not reach Syria until the end of 714 or the beginning of 715. Tárik had arrived many months before, and had thrown all the blame of disobedience upon Múza.

Múza was cast into prison, beaten with rods, exposed to the sun until he was nearly dead, and, lastly, fined 200,000 pieces of gold. His two sons were deprived of their governments, and orders were despatched to Spain to put to death Abdulaziz. Múza died in the greatest poverty at Wádí-l-korá, in the Hejáz, in 717.

MUSA, ABU ABDALLAH MOHAMMED BEN, of Khowarezm, the earliest writer on algebra, whose treatise was composed for popular use at the command of the caliph Al-Mamun. It contains rules and illustrations for the solution of simple and quadratic equations, with their application to questions, mostly of a mercantile character. From internal evidence it appears to be drawn from Hindoo writings.

This work was partially translated into Latin at an early period; and M. Libri has printed all the part of Ben Musa's treatise which the Latin manuscripts in the Bibliothèque du Roi at Paris contain. The complete work, in Arabic, with an English translation and notes by the late Dr. Rosen, was published by the Oriental Translation Society, in 1831, from a manuscript in the Bodleian Library.

It is from this work that (so far as Europe is concerned) algebra derives both its name and introduction. Mohammed Ben Musa was frequently called the inventor of Algebra, a title to which he has no claim.

MUSA, a name given to a genus of plants having eatable fruit in tropical countries. The *M. Sapientum*, or *Plantain*, has a fruit used to a prodigious extent by the inhabitants of the torrid zone; and, from its nutritious qualities and general use, it may, whether used in a raw or dressed form, be regarded rather as a necessary article of food than as an occasional luxury. In tropical countries the plantain is one of the most interesting objects of cultivation for the subsistence of man. Three dozen fruits will maintain a person, instead of bread, for a week, and appears better suited to him in warm countries than that kind of food. Indeed the plantain is often the whole support of an Indian family. The fruit is produced from among the immense leaves in bunches, weighing 30, 60, and 80 lbs., of various colours, and of great diversity of form. It usually is long and narrow, of a pale-yellow or dark-red colour, with a yellow farinaceous flesh. But in form it varies to oblong and nearly spherical; and in colour it offers all the shades and variations of tints that the combination of yellow and red, in different proportions, can produce. Some sorts are said always to be of a bright green colour. In general, the character of the fruit to an European palate is that of mild insipidity; some sorts are even so coarse as not to be edible without preparation. The greater number however are used in their raw state, and some varieties acquire by cultivation a very exquisite flavour, even surpassing the finest pear. In the better sorts the flesh has the colour of the finest yellow butter, is of a delicate taste, and melts in the mouth like marmalade. In the West Indies, plantains appear to be even more extensively employed than in the Eastern world. The modes of eating them are various. The best sorts are served up raw at table, as in the East Indies, and have been compared for flavour to an excellent reinette apple after its sweetness has been con-

densed by keeping through the winter. Sometimes they are baked in their skins, and then they taste like the best stewed pears of Europe. They are also the principal ingredient in a variety of dishes.

Plantain (*Musa Sapientum*).

The plantain prefers a rich fat soil; for in sandy places, where it flowers abundantly, it produces no fruit.

The *Banana* of hot countries is a mere variety of the plantain, distinguished by being dwarf, with a spotted stem. Botanists call it *Musa Paradisiaca*, in allusion to an old notion that it was the Forbidden Fruit of Scripture.

MUSA'CEÆ are a natural order of Endogens, of which the genus *Musa* is the representative. They are generally stately and always beautiful herbaceous plants with the aspect of a plantain. Only four genera are known of this order; all consisting of species of striking beauty. The *Heliconias* are the principal American form. The *Strelitzias* are Cape plants with rigid glucous leaves. The *Ravanala* of Madagascar, *Urania speciosa*, a noble palm-like plant, is remarkable for the brilliant blue colour of the lacerated pulpy aril which envelopes the seeds; the latter are used for dyeing in Madagascar, but none of the order are of any important use to man, with the exception of *Musa* itself.

MUSÆ'US. Two, if not more, Greek poets of this name are known. One of them is the author of the interesting Greek poem entitled 'Hero and Leander.' The age in which the author lived has been a subject of much dispute. The most general opinion is, that he lived in the lower ages of the Roman empire. The poem of 'Hero and Leander' consists of 340 hexameter lines, which contain the whole account of the beginning of the loves of Leander and Hero, the daring of Leander in swimming by night across the Strait from Abydos to Sestos to visit his mistress, and the tragical end of both lovers. Ovid has treated the same subject in Latin verse in his 'Heroides;' and we have, in English, Marlowe's and Chapman's 'Hero and Leander.' Schäfer's edition of Musæus, Greek and Latin, Leipzig, 1825, is an improved republication of Schrader's edition.

MUSÆUS, JOHANN KARL AUGUST, was born at Jena in 1735, and studied in the university there. His first literary production, which appeared in 1760, was his 'Grandison the Second,' a satirical parody on Richardson's novel. This book passed through several editions. After an interval of 18 years, he published his 'Physiognomical Travels.' The success of this work induced him to avow himself the author; whereupon he became the literary idol of the day. Stimulated by success, he forthwith set about his 'Volksmährchen.' His next work was that entitled 'Freund Heins Erscheinungen, in Holbeins Manier,' a kind of literary 'Dance of Death.' Excepting a collection of novellettes and tales, entitled 'Straussfedern,' and another for children, 'Freund Hein' was his last work, for he died October 28, 1787.

MUSCA, a genus founded by Linnæus for the reception of the dipterous insects, commonly known as Flies. The Linnæan genus has been broken up by subsequent entomologists into many genera and many families. Of the typical family *Muscidæ* no fewer than 1700 European species have been described by Meigen, and nearly as many more extra-European have been described by Robineau Desvoidy in a quarto volume of 812 pages, devoted entirely to this subject.

Many of the *Muscidæ* are interesting on account of their habits. Some of the species of *Myobia* deposit their eggs in the nests of Hymenoptera, so that their larvæ when hatched may feed on the stores of provisions there collected. The larvæ of *Tachina* are parasitic on other larvæ. Those of some other genera are only found in the dead bodies of particular species of animals, as *Cynomyia*, which reside in the carcases of dead dogs. The Blue-Bottles and Blow-Flies, species of *Lucilia* and *Calliphora*, lay their eggs in meat, which becomes fly-blown. *Anthomyia* deposits its eggs in manure or in the roots of vegetables, and *Tephritis* in growing plants. The cheese-maggot is the larva of an insect of this family named *Piophila Casei*. *Drysophila Cellaris* deposits its eggs in fermented liquors.

Most of these flies are extremely prolific; the ovaries of the female flesh-fly (*Sarcophaga carnaria*) have been found to be arranged in spiral fashion, and to contain as many as 20,000 eggs.

(Westwood, *Introduction to the modern Classification of Insects;* and the writings of Meigen, Haliday, Desvoidy, and Macquart.)

MUSCA (the Fly), a constellation so called by Lacaille, being the *Apis* of Bayer. It is situated immediately below Crux, and between the latter and the South Pole.

MUSCA'RI, a genus of plants belonging to the natural order *Liliaceæ*. *M. racemosum*, Grape Hyacinth, is the only British species of this genus. It abounds in Suffolk near Pakenham,

and is found in some other parts of Great Britain. The flowers are of a dark blue colour. It grows most abundantly in sandy fields.

MUSCAT, a city and sea-port of Arabia, is situated at the entrance of the Persian Gulf, on the southern coast of the Gulf of Oman, in 23° 38′ N. lat., 58° 37½′ E. long. The population is estimated at 40,000. The town stands on a sandy beach at the bottom of the cove which forms the harbour. It is an ill-built and dirty place, and in the months of July and August the heat is excessive. The harbour is defended by forts, and may be said to be the key of the Persian Gulf. Muscat derives its importance from the commerce and navigation of which it is the centre. The Imaum of Muscat has some large ships of war, and his subjects possess some of the finest trading vessels in the Indian seas.

MUSCI, or MOSSES, constitute a group of cryptogamic or flowerless plants, of considerable extent and of great interest on account of their very singular structure. They are in all cases of small size, never exceeding a few inches in height, and though often of almost microscopical minuteness, are furnished with leaves arranged over a distinct axis of growth, and are propagated by means of reproductive apparatus of a peculiar nature. They have no trace of spiral or other vessels in their tissue, but are formed entirely of cellular tissue, in the stem lengthened into tubes. For a long time they were thought to be destitute of a breathing apparatus, but the apertures through which this function is performed were discovered by Treviranus and Unger, and especially by Mr. Valentine. It is however remarkable that they should be confined to the organs of fructification, and not found on those of vegetation.

Mosses are among the first plants that spring up on the surface of inorganic matter, at first appearing like a green stain, when they merely consist of germinating spores, but soon clothing themselves with leaves, and then by their decay producing the earliest portion of decomposed vegetable matter with which the soil is fertilised.

MUSCICAPIDÆ, *Flycatchers*, a family of insectivorous birds, established by Mr. Vigors for a number of forms, of which the Common Flycatcher (*Muscicapa grisola*) may be regarded as the type. These birds take their insect food on the wing by short flights, returning to their perch after each chase of prey. Their beak is depressed, and the gape wide; and generally the rictus is furnished with close-set bristles. These birds are the Gobes-Mouches of the French, and are placed by Cuvier between the *Pies-grièches* (Butcher-Birds) and the Cotingas (*Ampelis*, Linn.).

Flycatcher (*Muscicapa grisola*)

MUSCIDÆ. [MUSCA.]

MUSCLE is an animal tissue composed of bundles of soft and usually reddish fibres, endowed with a peculiar power of contracting.

The muscles are divided into two classes; the voluntary and the involuntary. The former class, those over which the will exercises a direct control, are subservient to all the actions by which the animal is placed in active relation with the external world, as in all the motions of the limbs, of speech, of the eyes, ears, &c., and they are therefore often called the muscles of animal life; the latter class, comprehending those whose actions are connected with the internal and nutritive functions of the body, over which the will has no immediate or constant control, form the muscular system of organic life, as the heart, the muscular coat of the stomach, &c.

All the muscles receive large arteries and veins from the trunks passing near to them, whose branches run in the cellular interspaces between the fasciculi, and form at last an irregular network among the fibres. They receive also a large supply of nerves, probably more than any other organs in the body. Nearly one-half of the brain and spinal chord is for the supply of nerves through which the will may act upon the voluntary muscles, or through which their motions may be excited by other stimuli. The involuntary muscles are chiefly supplied from the ganglionic or sympathetic system of nerves.

Chemically, the muscles are composed chiefly of fibrine. Those of animals, which form a large portion of our food, have been carefully analyzed by Berzelius and many others, who have found that the muscular tissue generally contains about 77 per cent. of water, the rest being composed of fleshy fibre or fibrine, a small quantity of fat and gelatine, albumen, and colouring matter, and a number of peculiar extracts, of which the chief are osmazome, on which the odour of meat depends, and zomidine, from which they acquire their peculiar flavour. They also contain the salts of potash in large quantities. The nutritive qualities of meat are in direct proportion to the quantity of fibrine which it contains; and this may generally be judged of by the strength and ruddiness of the fibres: hence the more nutritious quality of the muscles of adult than of young animals, and of those parts of animals which are most exercised; though for cooking it is necessary to avoid the toughness of fibre which usually coincides with great strength and a large quantity of fibrine.

The colour of the muscles is dependent partly on the blood which they contain, but chiefly on a peculiar colouring matter, very similar to that of the blood, which is fixed in their tissue.

The peculiar vital power of the muscular tissue is its contractility; that is, the power which its

fibres possess, when stimulated by the will or other means, of shortening themselves, and thus approximating the points to which their extremities are attached. When muscles contract, they become shorter, harder, and thicker, but their actual size remains the same, for what they lose in length they exactly gain in breadth and thickness. The fasciculi are also wrinkled or thrown into undulated lines, which are most visible when the contraction is least powerful and rather trembling, and the fibres vibrate so as to produce a distinct sound. The more powerful the contraction, the more rapid are the vibrations of the muscular fibres, the higher the note which they produce, and the greater the difficulty of perceiving them with the eye.

The relaxation of a muscle presents phenomena exactly the converse of those of its contraction. The power by which the voluntary muscles are lengthened after having contracted is generally the extension to which, when they cease to act, they are subjected by some other muscles (their antagonists), whose action is the opposite of their own. The hollow involuntary muscles are usually extended after contraction by the accumulation of fluids or other substances forced into their cavities by some external power.

An almost infinite variety of arrangement is found in the muscular fibres adapted to the especial purpose which each muscle has to fulfil, whether it be chiefly strength of action, or rapidity or extent of motion; and all are guided by the nicest mechanical rules. Wherever strength is more necessary than a wide extent of motion, the fibres are increased in number and placed obliquely to the direction of the resistance; wherever extent of motion is more needed than strength, the fibres are long, and run almost straight from one point to the other, so as to give the full benefit of their contraction; where velocity is required, they are placed at a part of a lever close by the centre of motion, the resistance being placed on a part more distant from the centre. In general the absolute power exerted by a muscle in contracting is much less than its efficient power, a great part of its force being lost in its being inserted obliquely on the lever which it has to move, or in the distance of the resistance from the centre of motion, or in the resistance which other muscles and the adjacent tissues, which have to be extended, present, &c. But it is constantly found that where power is lost, a corresponding gain of velocity or extent of motion, or of convenience and compactness of form and readiness of action, is obtained.

MUSCLE, or MUSSEL. [MYTILUS EDULIS.]

MUSCOVY DUCK. [DUCKS.]

MUSES (*Musæ* in Latin, *Μοῦσαι* in Greek), the name of certain sister goddesses in the Greek mythology, who were supposed to preside over the arts of poetry and music, and the sciences of history and astronomy. Hesiod, in his 'Theogony' (53), reckons nine Muses, daughters of Zeus and Mnemósyne, and gives their names as follows:—Callíope, Clío, Melpómene, Thalía, Eutérpe, Terpsíchore, Érato, Polyhýmnia, and Uránia, and he says that Piéria in Macedonia was their first dwelling-place. These are the Muses generally alluded to by the poets. It appears that the worship of the Muses was introduced from Macedonia into Bœotia, Phocis, and other parts of Hellas. The Muses were represented as handsome and modest virgins, dressed in long tunics, with leaves of laurel, ivy, or palm-leaves, on their heads. It was only in later ages that peculiar attributes were given to each of them by the artists, and a peculiar department of science was assigned to each by the poets.

MUSE'UM, a place dedicated to the Muses, from the Greek *Mouseion* (*Μουσεῖον*); hence any place where learning is pursued, or which is set apart as a repository for things that have some immediate relation to the arts, is so termed. The earliest institution we are acquainted with which received this appellation was the museum founded at Alexandria by Ptolemæus Philadelphus.

MUSGRAVE, WILLIAM, born in 1657, in the county of Somerset, studied at Oxford, where he took his degree of M.D. In 1684 he became secretary to the Royal Society of London. In 1691 he fixed his residence at Exeter, where he practised as a physician, and where he died in 1721. Dr. Musgrave was a good scholar, and well versed in antiquity. He wrote several works on classical and on medical subjects and on Anglo-Roman antiquities.

MUSGRAVE, SAMUEL, M.D., the grandson of the above, also practised as a physician in Exeter, and died there in 1782. Besides a few works on medical subjects, he was the author of 'Exercitationes in Euripidem,' 8vo., Leyden, 1762; 'Animadversiones in Sophoclem,' 3 vols. 8vo., Oxford, 1800; and some other works. He also assisted in the edition of Euripides, 4 vols. 8vo., Oxford, 1778.

MUSHROOM. The species of mushroom usually cultivated is the *Agaricus campestris*. In the order of fungi, which includes that plant, most species are poisonous, and fatal consequences have resulted from ignorance of the characters by which the wholesome mushroom is distinguished from such allied species as are liable to be mistaken for it. [AGARICUS.]

Mushrooms are indigenous; they spring up abundantly in fields where cattle have been pastured, if the soil and temperature prove favourable for the development of the *spawn*, a term which is applied to the substance in which the reproductive principle is embodied, which presents to the naked eye the appearance of whitish mouldiness, and which is in reality the flocculent subterranean stem, while the mushroom itself is the fruit. In this state spawn may be kept for years if moisture be withheld; but if the latter be supplied, in conjunction with a proper degree of temperature, it is further developed into white filaments and tubercles, which ultimately rise above the soil in the form of mushrooms. These spring up sometimes singly, but frequently in a gregarious manner.

Mushrooms appear in the fields chiefly after Midsummer, in the months of July, August, and most abundantly in September.

With regard to moisture it may be observed that a dry atmosphere is injurious, not only to

artificial crops but also to those in the fields; for the latter warm foggy mornings are most favourable, and these should be imitated as closely in cultivation as circumstances will permit. A gentle steam is more easily maintained in mushroom-houses than in structures adapted for other subjects of cultivation where light is an object of importance; but mushrooms do not require its agency, and therefore a glass roof is unnecessary: on the contrary, the roof and walls where they are intended to be grown should be composed of such substances as will cause the least possible condensation of the internal vapour, and which are in other respects eligible for the purpose.

Various compositions have been successfully employed in the formation of mushroom beds. Horse-dung, chiefly fresh droppings, or with only some of the shortest litter intermixed, is however principally esteemed; and such should be collected when the horses are not on green food, but are being fed on corn, or on corn and hay. If the beds are intended to be formed of considerable thickness, which some prefer because they continue longer in a bearing state, then it is proper that the fresh dung should be mixed with some old hot-bed materials, or with light loam, in such proportion as will prevent a too violent fermentation. In all cases the composition should only possess sufficient moisture to induce fermentation. It may then be compactly deposited in any dark situation where the temperature and moderate moisture of the atmosphere can be rendered congenial, either in boxes that are moveable or in such as are fixed on purpose along the walls of a shed or mushroom-house, the construction of which may be that of any convenient form, provided its adaptation to the principles here mentioned be kept in view. The bed should not however be in immediate contact with the ground, unless under circumstances which may occasion the latter to possess a temperature of between 60° and 65°.

MUSIC is the artistic union of inarticulate sounds and rhythm, exciting agreeable sensations, and raising mental images and emotions directly or indirectly pleasing. Such is pure unmixed music. When conjoined to poetry, it is an art not of diminished importance, but of a dependent nature, its office then being to enforce the meaning of the words and add a colouring to them. As an adjunct it is a beautiful illustration of language; combined with the sister art, it becomes a highly ornamented kind of eloquence. Music is a language that speaks by imitating, and as such it is understood by those who have successfully studied the art, and likewise by mere amateurs, who, with little if any knowledge of its principles, have learnt the meaning of its expressions by long practice, and by frequently hearing and enjoying its performance.

The effect of Rhythm, or measure, is universally felt and admitted: the most polished inhabitants of Europe, and the most barbarous natives of the arctic regions, are alive to its influence; it is that which reduces unmeaning sounds to order, converts them into melody, and bestows on them proportion and a power to charm.

Much of the effect of instrumental music on the mind is ascribed to Imitation, which is either direct or indirect. The power of direct imitation is confined within very narrow limits. The song of some birds, the whistling of winds, the roaring of the tempest, the sound of cannon, the ringing and tolling of bells, and perhaps the tones of the human voice expressive of certain emotions, are legitimate objects of direct imitation; but the rattling of hail, the fall of snow, the motions of animals, actions at sea, battles on land, &c., are not only unrepresentable by any kind of musical instrument at present known, but unfit for imitation if instruments could be constructed for the express purpose.

Indirect Imitation is that by which some quality common to music and the thing imitated is indicated by sounds, strong or weak, quick or slow. Rage is loud, anger is harsh, love and pity are gentle; therefore loud and harsh sounds raise ideas of the former passions and others of the same class; soft and tranquil sounds raise ideas of the latter and others of a similar character. Hence it will be seen, that the hearer may interpret music in a manner corresponding in some degree to the state of mind in which it shall find him, but under certain restrictions from which he cannot be released.

Association, which has so large a share in the operations of the human mind, often contributes much to the effect of music. Indeed some airs possessing no intrinsic merit owe their influence solely to this principle, and among these the famous 'Ranz des Vaches,' which, in times gone by, acted with such irresistible force on the expatriated Swiss soldier. It must be admitted, however, that modulated sounds please, by some mysterious means, many to whom they present no imitation of anything material or immaterial, and who associate with them no other idea than that of melody or of harmony.

Vocal music is entirely devoid of that ambiguity which some think a merit in instrumental music, and some consider a defect. Words fix the intention of musical sounds, leaving nothing for the hearer to conjecture; except in so far as the composer may be defective in judgment, accentuation, or emphasis. But the heaviest charge brought against composers of vocal music, and that which has most exposed them to ridicule, is the attempt to express the literal meaning of a particular word rather than the sentiment or the sense of the entire passage.

In the accompaniment to vocal music, much greater freedom of imitation is allowable than in the voice part. Kept within those bounds which good sense and cultivated taste prescribe, it affords very efficient aid, by giving greater force to the poetry, and contributing to the completion of the general design. It also adds harmony to song, a most important support. Nearly all that imitation can do should be assigned to the accompaniments, as these, on account of the greater compass and variety of instruments, are better adapted to such a purpose than the voice, which ought to be left at liberty to express the sentiments.

Music, which is both a science and an art, is divided into *Speculative* or theoretical, and

Practical. Speculative Music explains the nature of musical sounds; shows, by demonstrating their ratios, how they are related to each other; and investigates their physical and moral effects when in a simple or in a combined state: it is, in few words, the philosophy of the art. [Acoustics.] Practical Music is the application of theoretical principles—the proper conduct of sounds as to their progression, duration, union, and adaptation to words, voices, and instruments, and is the art of composition. [Melody; Harmony; Rhythm.]

MUSIS, A. DE. [Veneziano, Agostino.]

MUSK DEER. [Moschidæ.]

MUSK, the odorous secretion of a species of Deer [Moschidæ] contained in a peculiar abdominal sac, in the Male Musk Deer (*Moschus moschiferus*). This species is a native of Tonquin, Tibet, Nepaul, the mountain regions of Siberia and China, &c. By the analysis of Geizar and Reiman musk appears to consist of 1, a peculiar volatile principle, which can exist in a free state; 2, ammonia; 3, a peculiar fixed uncrystallisable acid (these three are in undeterminable quantity); 4, stearine and oleine; 5, chloresterine; 6; a peculiar bitter resin; 7, osmazome, with several salts; 8, a mouldy-like substance, in part combined with ammonia and several salts; 9, sand; 10, water, acid, &c., with some volatile odorous matter. It should be observed that musk in its transport from Tibet to Europe is frequently adulterated.

Taken in the dose of a few grains, musk rouses the energy of the digestive organs; and it soon afterwards produces sympathetic phenomena, the powers of the whole animal system appearing suddenly increased. By repeating the doses till half a drachm or a drachm is consumed, the active principles penetrate the whole frame, influencing all the tissues, and exciting effects demonstrative of its stimulating property; the blood circulates with more force, accompanied sometimes with bleeding from the nose: the perspiration and other secretions are perceptibly increased. It is found to be most useful in diseases purely nervous and spasmodic, where no inflammatory action is present.

MUSK-RAT. [Musquash.]

MUSK-THISTLE. [Carduus.]

MUSKET, or MUSQUET. [Arms.]

MUSLIN, a thin cloth made of cotton. The name is supposed to be derived from Masalia, since called Masulipatam, from which place such fabrics were first imported into Europe. Until the early part of the present century all the muslin used in Europe was of the manufacture of India. Some of the muslins of India, and especially those of Dacca, are of the most astonishing degree of fineness, so as to justify their poetical description as 'webs of woven wind.' Such however has been the result of the mechanical inventions of England in this branch of industry, that not only are muslins of British manufacture now used at home, to the exclusion of those woven in India, but large quantities are exported to all parts of the world, and find their way even far into the interior of India.

MUSOPHAGIDÆ, Mr. Vigors's name for a family of birds, known as *Plantain-Eaters*, including the genera *Phytotoma, Colius, Corythaix, Musophaga*, &c. (Vigors 'On the Natural Affinities that connect the Orders and Families of Birds;' 'Linn. Trans.,' vol. xiv.)

MUSQUASH, the Cree name for the *Fiber Zibethicus* of Cuvier, *Ondatra* of Lacépède, a semi-aquatic rodent animal inhabiting the high regions of North America. Its fur is valuable. ('Fauna Boreali-Americana.') [Muridæ.]

Musquash (*Fiber Zibethicus*).

MUSSCHENBROEK, PETER VAN, was born at Leyden, March 14, 1692. He received a good classical education in the university of his native city, and afterwards applied himself to the study of medicine. In 1717 he formed an intimacy with the celebrated s'Gravesande, and the introduction into Holland of the Newtonian system of philosophy was principally owing to the labours of these two men. Musschenbroek visited England; and after his return to the Continent he was, in 1719, appointed professor of philosophy and mathematics, and professor extraordinary of medicine in the university of Doesburg on the Rhine, where he gained great reputation by his lectures. In 1723 he was invited to fill the chair of philosophy and mathematics in the University of Utrecht, and there he remained many years. In 1739 he accepted the professorship of mathematics in his native city, Leyden, which had become vacant by the death of Wittichius; and in the university of that city he remained attached during the rest of his life. He died Sept. 1, 1761. Musschenbroek published at Leyden, in 1726, a work entitled 'Epitome Elementorum Physico-Mathematicorum,' 12mo., which went through several editions. But the work which has gained the author most celebrity is his 'Physicæ Experimentales, et Geometricæ Dissertationes,' Leyden, 1729, 4to. This work consists of four treatises: one on the magnet, one on capillary attraction, one on the size of the earth, and one on the cohesion of bodies. He also published at Vienna, in 1754, a work entitled 'Dissertatio Physica Experimentalis de Magnete.'

Besides the above works Musschenbroek wrote many papers on meteorology, some of which appeared in the 'Memoirs of the French Academy of Sciences,' and some in the 'Transactions of the Royal Society of London.'

MUSSELBURGH. [EDINBURGHSHIRE.]
MUSSULMAN. [MOHAMMED.]
MUSTAPHA I., II., III., IV. [TURKEY.]
MUSTARD. [SINAPIS.]
MUSTELA. [WEASELS.]

MUTI'LLIDÆ, a family of Hymenopterous insects corresponding to the Linnæan genus *Mutilla*. These bees belong to Latreille's division *Fossores*, and some of the species are remarkable for the power of their stings.

MUTINY ACT, The, is a series of regulations which, from year to year, are enacted by the Imperial Parliament of Great Britain for the government of the military force of the country. The first Mutiny Act was passed on the 12th of April, 1689.

Avoiding the acknowledgment that any power exists in the Crown for the appointment of courts-martial, the act authorises their majesties to grant commissions to general officers to assemble such courts for the purpose of trying and punishing such offences as mutiny and desertion. Provisions are also made that nothing in the act shall exempt an officer or soldier from the ordinary processes of law; that it shall not concern the militia troops; and that it shall only continue in force till the 10th of November in the same year. The act has ever since, with one exception, been annually renewed: after the bill which passed in April, 1697, for one year as usual, had expired, no other was passed till March, 1702; and on a few occasions the bill has been suffered to expire for several days before the following one received the royal assent.

The Mutiny Act has varied in many particulars from that which was first passed, but it has been uniform in all its principal points; such as the dependence of a standing army on the consent of parliament, and the subjection of military men to all the processes of ordinary law. It may now be considered as a general code of law, in which are defined all military offences of the higher class, and, as precisely as possible, nearly all those of minor importance.

The act defines the constitution and powers of courts-martial; it contains clauses relating to the enlistment of recruits, the issue of pay and marching money, the quartering of soldiers, and the supplying of carriages for the conveyance of troops and baggage. The act moreover contains a repetition of the original clause in which it is declared that the ordinary course of law is not to be interfered with when a soldier is accused of a capital crime; and it states that a man cannot be taken from the service for a debt under 30*l*.

Before the union of Ireland with Great Britain there was a separate Mutiny Act for the former country, but now the same act applies to both. The officers and troops of the East India Company are subject to their own Mutiny Act, which, however, agrees exactly with that of the government forces.

The gradual extension of the provisions of the Mutiny Act to those military offences which may be considered as secondary, does not seem to have been noticed on behalf of the crown further than by the occasional reservation of its right to make Articles of War for the better government of the forces, which is expressed in the acts passed during the reign of Queen Anne. In the first year of George I. this right of the crown was formally allowed; and the clause containing it has been repeated in all subsequent mutiny acts, with the provision that no person within the United Kingdom and British Isles shall be subject to transportation, or to any punishment affecting life or limb, for crimes specified in the Articles of War, except such as by the Mutiny Act itself are liable to the same punishments.

The *Articles of War* which are at present in force, and which have from time to time been promulgated, are divided into twenty-four sections. Many of these correspond exactly to clauses in the Mutiny Act; others, though relating to subjects in the latter, define the particulars of the crime and the punishment applicable to it with more precision; and there are Articles which have no counterparts in the act.

These Articles, being made by the Crown as head of the army, or by the commander-in-chief, are to be obeyed as being the commands of a superior officer; but the writers on military law observe that the legality of the Articles may itself become the subject of examination in a court-martial, whereas the Mutiny Act must be obeyed without inquiry. In this particular therefore the Articles of War are to be distinguished from the Act; and whatever case may occur, the letter only of the law, as contained in the Act, must be followed in awarding the punishment due to a crime affecting life.

The bill on which are founded the Articles of War for the Navy was passed in the 22nd Geo. II., and this consolidated all the laws previously made for the government of the ships and vessels bearing royal commissions, as also of the forces at sea.

MUTZIG. [RHIN, BAS.]

MUZARAB, *i.e.* a Christian living under the sway of the Arabs. The name was given by the Moors of Spain to all Christians living under Moslem jurisdiction in Cordova, Seville, Granada, Toledo, and other large cities. But the word is better known to us as connected with the ancient liturgy of the Goths, which governed the Spanish church down to the twelfth century, and was called the 'Muzarabic Office' (*Missal Muzárabe*), owing to its being preserved by the Muzarab Christians of Toledo during the time of their subjection to the Arabs. There is still a chapel in the cathedral of Toledo where mass is performed every day agreeably to the Muzarabic ritual. It was founded by Cardinal Ximenes de Cisneros.

MUZIA'NO, GIRO'LAMO, an Italian painter, was born at Acquafredda near Brescia, in 1528. About 1550 he went to Rome, where he first attracted notice as a landscape painter, but soon became one of the first painters of his time, and was praised by Michel Angelo. There are many of Muziano's works in the churches and palaces of Rome, in oil and in fresco; there are also works by him in the cathedrals of Orvieto and Foligno, and in the church of the Madonna at Loreto. There is likewise a very celebrated picture by

him of Christ washing the feet of his disciples, in the cathedral of Rheims. As an architect, he built the Capella Gregoriana, or the chapel of Gregory XIII., in St. Peter's, in which are two of his best pictures, which however he did not live to complete; they were finished by his most distinguished scholar Cesare Nebbia, a painter of Orvieto. The foundation of the Academy of St. Luke at Rome is also due chiefly to the exertions of Muziano: he procured the brief for its establishment from Gregory XIII., and it was confirmed by Sixtus V.

Muziano died at Rome in 1590, according to Baglione, but Ridolfi says in 1592.

MYCE'NÆ, an ancient town and state in Northern Peloponnesus, which in the time of its king, Agamemnon, was the most powerful state of Greece. The small kingdom of Argos was then subject to Mycenæ; but after the death of Agamemnon and the extinction of the dynasty of Atreus, Argos gained the ascendancy over Mycenæ, which however appears to have maintained a sort of independence, being protected by Sparta, with which Argos was often at variance. After the end of the campaign against Xerxes, the Argeii, being joined by the people of Tégea and Cleónæ, attacked Mycenæ, which they took after a stout resistance, and razed to the ground, B.C. 468. Part of the inhabitants were made slaves and the rest emigrated. Mycenæ never rose from its ruins, which are still of considerable magnitude, and very remarkable. In the time of Pausanias (ii. 15, 16) they consisted of a great part of the walls, with the gate called that of the Lions, from lions being sculptured above it, said to be the work of the Cyclopes; the fountain called Perseia; and the subterraneous buildings of Atreus and his sons, in which their treasures were deposited. There were likewise to be seen the tombs of Atreus, Agamemnon, of his charioteer Eurýmedon, of Electra, and others. The ruins of Mycenæ have been visited in recent times, among others, by Lord Elgin, by Cockerell, Dodwell, and Leake, who gives a description of them in his 'Travels in the Morea,' vol. ii.

MYCETES, a genus of *Quadrumana* (Monkeys) peculiar to South America, and remarkable

Araguato (*Mycetes ursinus*).

for the powerful development of the organ of the voice. Its length is nearly three feet, without including the tail. The hair is of a golden red but the beard is of a deeper colour than the rest. Their food consists of fruit and the leaves of plants. The species are, as the name implies *Howlers*, and the horrible yells sent forth by these animals from the depths of the forests are described by those who have heard the mournful sounds as exceedingly distressing and unearthly. Humboldt and Bonpland heard the Araguato, one of the species (*Mycetes ursinus*), at the distance of half a league. In this genus the tail is prehensile. Habits gregarious; partially nocturnal. Thumb of the fore-paws not opposable to the fingers.

MY'CONOS, MICONI, one of the Cyclades situated E. of Delos, from which it is separated by a narrow channel, is about 10 miles in length and 6 miles in its greatest breadth. The island is mountainous and not very fertile: it produces some corn, wine, and cotton, but is deficient in wood. The population is about 4000. [ARCHIPELAGO, GRECIAN.]

MY'GALE, a genus of spiders, the species of which have their eyes placed closely together at the anterior extremity of the thorax. They spin their webs in the form of tubes, in which they reside concealed in holes in the ground, or under stones, or the bark of trees. In consequence of the representations of Madame Merian, some kinds of *Mygale* have become celebrated as Bird Catching Spiders. Mr. W. S. Macleay has however shown that Madame Merian's drawing is not to be trusted, since the *Mygale* there figured is a subterranean spider, and makes no net in which to entrap small birds. In a communication of Mr. Macleay's, published in the 'Annals of Natural History' for 1842, he remarks on the subject of Bird-Catching Spiders as follows:—'My conviction is that Madame Merian has told a wilful falsehood respecting *Mygale*, or rather has painted a falsehood; and that her followers have too hastily placed confidence in her idle tales. My conviction is that no *Mygale* can catch birds in its net; for, as I have said in the paper printed in the "Zoological Transactions," it makes no geometrical net. Nay, further, I have proved that the genus *Nephila*, which lives in a geometrical net does not catch birds either here or in the West Indies; and moreover, I have ascertained that birds are not the proper food of this New Holland *Epeira*.' The *Mygale Ionica*, a Grecian species forms a very ingenious trap-door with which to close up the mouth of its tube.

MYLODON. [MEGATHERIIDÆ.]

MYOPORA'CEÆ are a natural order of plants distinguished from *Verbenaceæ*. The plants referred to *Myoporaceæ* are chiefly shrubs of little interest, inhabiting the Australian regions and other parts of the southern hemisphere. The most remarkable thing connected with them is the presence of cysts of oil in their leaves, which thence have a dotted structure. The White Mangrove, a shore plant rooting in mud, is a curious species.

MYOSO'TIS, a genus of plants belonging to the natural order *Boragineæ*. The species are

annual or perennial, rough or smoothish plants, with blue flowers in terminal racemes, which are revolute before expansion. About fifty species have been described, which inhabit the more temperate parts of Asia, Africa, and America, and are found abundantly in Europe. Eight species are found in Great Britain. *M. palustris*, Great Water Scorpion-Grass, or Forget-me-Not, is a native throughout Europe, and also of Asia and North America. In Great Britain it is found in humid meadows, bogs, banks of rivers, rivulets, and ditches. This plant has a large bright blue corolla with a yellow eye. A variety is described with white flowers. The following are the remaining British species of this genus :—*M. repens*, Mouse-Ear, is found in boggy places. *M. cæspitosa* is found in watery places. *M. suaveolens* is found in Scotland on the summits of the Breadalbane Mountains. *M. sylvatica* is found in shady places. *M. arvensis*, Field Scorpion-Grass, grows in cultivated land and thickets. *M. collina* is found on dry banks. *M. versicolor* has small flowers, at first pale yellow, afterwards blue. It is found in meadows and on banks. None of the species are used in medicine or the arts. The British species are most desirable for cultivation, especially *M. palustris* and *repens*.

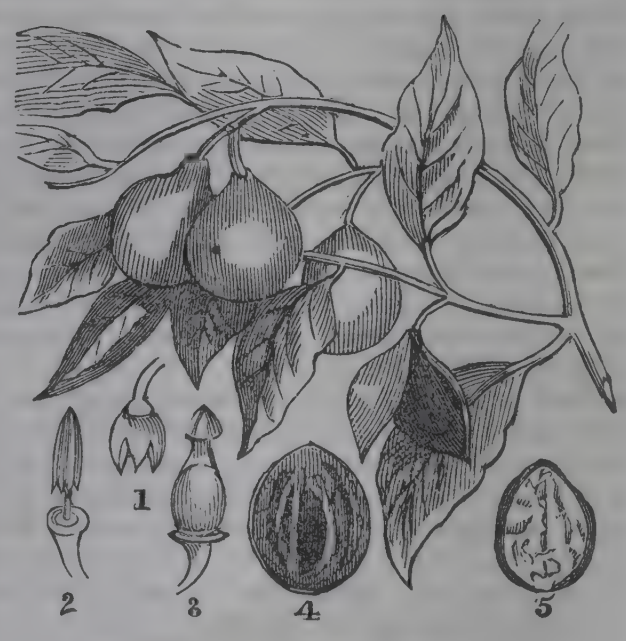
MYOSU'RUS, a genus of plants belonging to the natural order *Ranunculaceæ*. *M. minimus* grows in damp places and in fields. It is a native of Europe and America. The American plant there is every reason to believe is the same as the British and other European plants.

MYRI'CA, a genus of plants the type of the natural order *Myricaceæ*. One species, *M. Gale*, the Sweet Gale, or Box Myrtle, is a native of Great Britain. It is a bushy plant, about 4 feet in height; the catkins are sessile and erect; the fruit is covered with resinous glands, and the leaves are fragrant when bruised. This plant is found on the Continent of Europe, and also in North America, under the same circumstances as in Great Britain. *M. cerifera*, Wax-Myrtle, or Bay-Tree, is a native of woods in the United States of America. The bark of the root of this plant is acid and astringent; in large doses it produces vomiting, accompanied by a burning sensation in the throat. It is used as a stimulant and astringent. The wax of the fruit is collected and purified, and used as a substitute for bees-wax and for making candles.

MYRICA'CEÆ are plants constituting a very small natural order of Apetalous Exogens, with separate sexes. They are common in the temperate parts of the world, especially in North America and the Cape of Good Hope. With us the only species is the Sweet Gale, a common fragrant bush inhabiting wet commons. They are all more or less fragrant and aromatic; and one of them is called *Myrica cerifera*, or the wax-bearing, from the drupes being covered with a waxy secretion, which may be readily separated and manufactured into candles; whence has arisen its popular name of Candleberry Myrtle.

MYRIOPHYLLUM, a genus of plants belonging to the natural order *Haloragecæ*. The species are floating aquatic herbs, rising above the water to blossom. *M. verticillatum* is a native of Europe, in ponds, ditches, pools, and lakes, but never in running water. It is found in Great Britain but is a rare plant. *M. spicatum*, is a native of Europe and North America, in ditches, lakes, and pools, never in running water; it is found abundantly in Great Britain.

MYRI'STICA MOSCHA'TA, a tree native of the Molucca Islands, especially of Banda, but cultivated in Java, Sumatra, and elsewhere in the East, and of late years in Guiana and several of the West India Islands. It yields nutmegs and mace, the best of which are produced in the first-mentioned islands. The fruit is of the size and form of a peach, and when ripe, the fleshy part separates into two nearly equal halves, exposing the kernel surrounded by an arillus, the former being the nutmeg, the latter the mace. The odour of mace is strongly aromatic; the taste aromatic, but sharp and acrid. It contains both a fixed oil (in small quantity) and a volatile oil. One pound of mace yields by distillation one ounce of volatile oil. The fixed oil is not an article of European commerce, and what is termed the Expressed Oil of Mace is obtained from the Nutmeg, and should bear its name. An inferior mace is obtained from various species of *Myristica*. The properties of mace are similar to those of the nutmeg.



Nutmeg (*Myristica aromatica*).

1, a calyx; 2, the monadelphous stamens of a male flower; 3, the pistil of a female flower; 4, the seed of the nutmeg enveloped in the mace or aril; 5, a vertical section of the seed, showing the ruminated albumen and the small embryo at its base.

Two or three gatherings of the nutmegs are made in the year, generally in July and August, in December and in April. The third period yields the best nutmegs. The collected nuts are dried in the sun or by the heat of a moderate fire, till the shells split: they are then sorted and dipped in lime-water, to preserve them from the attack of insects. Those of good quality should be heavy, each weighing on an average 90 grains.

Nutmegs and mace, from the large quantity of volatile oil, are decidedly stimulant, and when

used in abundance produce, by exciting the circulation, narcotic effects. In moderation they promote the appetite and assist digestion.

MYRISTICA'CEÆ are tropical, fragrant, aromatic trees, with an astringent juice. The Nutmeg of the shops, which is the seed of *Myristica moschata*, is the only product of the order employed officinally. Other species bear fruit which may be employed as a substitute, but they are all inferior to the real oriental Myristica. Three genera of the order have been distinguished, namely, *Myristica*, inhabiting the tropical woods of Asia and America, and *Knema* and *Pyrrhosa*, both confined to India.

MYRME'LEON, a genus of large neuropterous insects, the larvæ of which are remarkable for their habit of entrapping their prey by means of pitfalls. Among the many accounts which have been published of their operations, one of the best and most recent is that given by Mr. Westwood, in the 'Magazine of Natural History' for 1838.

MYRON, one of the most celebrated sculptors of ancient Greece, was born at Eleutheræ in Bœotia, about 480 B.C. Myron was the fellow-pupil of Polycletus under Agelades; he was therefore in the prime of life at about the time that Phidias died; and he resided at the height of his fame in Athens at the commencement of the Peloponnesian war.

Pliny enumerates some of the works of Myron, of which several were preserved at Rome, and are mentioned by Pausanias and others, particularly a cow, which was celebrated by the poets. This was in bronze, as were most of his works, but Myron was also a sculptor in marble, a carver in wood, and an engraver of metals. Pliny mentions a celebrated marble statue of a drunken old woman, at Smyrna, by Myron; and Pausanias describes a single-bodied Hécate by him, with one head, in wood, which he saw on the island of Ægina: she was the chief divinity of the Æginetans according to Pausanias (ii. 30).

The Discóbolus, or Quoit-Thrower, by Myron, was one of the most celebrated works of ancient art: the original was in bronze, but there are still several ancient copies of it in marble, though not one entire: one in the Campidoglio, one in the Vatican, and a third was in the Villa Massimi at Rome; that in the British Museum was found in the villa of Hadrian near Tivoli, in 1791.

MYROSPERMUM, or *Myroxylon Peruiferum*, yields the Balsam of Peru, and probably also the Balsam of Tolu, though this is generally referred to *M. Toluiferum*. It is doubtful whether these are distinct species, or the same tree slightly differing, from circumstances connected with the place of growth.

Balsam of Peru occurs in two states; one is of a light-yellow colour, of an agreeable odour, resembling vanilla, and a somewhat acrid, bitterish, but aromatic taste. The other is of a blackish-brown colour, and not transparent.

Balsam of Tolu is of the consistence of a strong turpentine. It is of a yellow or brownish colour, transparent, with the taste and odour of the light-coloured Balsam of Peru. [BALSAMS.]

MYRRH. [BALSAMODENDRON.]

MYRRHIS, a genus of plants belonging to the natural order *Umbelliferæ*, and to the tribe *Scandiceneæ*. *M. odorata*, Sweet Cicely, or Great Chervil, is a native of middle and south Europe and Asia, from Spain to Asia Minor, also of Germany, Switzerland, Austria, the south of France, and the north of Italy. In Great Britain it is found in pastures and hilly districts. This plant was formerly much used in medicine. It yields a volatile oil which has a pleasant odour.

MYRSINA'CEÆ are chiefly subtropical plants of the Exogenous class, so nearly the same in their fructification as the Primulaceous species of northern climates, that scarcely any valid mark of distinction can be found between them. The general appearance of the two orders is however widely different; *Primulaceæ* consisting of herbs with no development of woody matter, while *Myrsinaceæ*, in all cases yet observed, are shrubs or trees. Many of the species have handsome foliage and gaily-coloured flowers, on which account they are frequently met with in gardens, but they are of no importance for useful purposes. *Ardisia* and *Jacquinia* are the two commonest genera.

MYRTA'CEÆ are polypetalous Exogens, forming a very extensive and important natural order of plants, exclusively inhabiting warm countries, and in all cases either shrubs or trees; an herbaceous form of the order is unknown. The most northern station of the species is the south of Europe, where the common Myrtle (*Myrtus communis*) grows wild. Among the table-fruits of the tropics are the Guava, yielded by different species of *Psidium;* the Rose Apple and Jamrosade produced by *Eugenia Malaccensis* and *Jambos*; of spices, Cloves are the flower-buds of *Caryophyllus aromaticus;* and Allspice consists of the dried berries of *Eugenia Pimenta:* all which are obtained from plants belonging to the same section as the common Myrtle.

The species with capsular fruit are principally found in New Holland, where, in the form of *Eucalyptus* and *Leptospermum*, they constitute one of the most striking features of the vegetation.

MYRTLE, the *Myrtus communis* of botanists, is a bush with evergreen opposite leaves, which when seen by transmitted light, appear as if pierced with small holes, in consequence of their containing a great number of little reservoirs of transparent aromatic oil; the flowers are white and have a very agreeable scent.

The Myrtle is apparently wild along the south coast of France, and in Sicily it occupies large tracts of country; but it does not appear to be really a European plant, but a native of Persia. In this country the Myrtle is seldom able to bear the winter, except when planted in front of a south wall, and protected from severe weather. In the Isle of Wight, some places along the south coast of England, and in many of the mild parts of Ireland, it however becomes an ornamental bush, without requiring any protection.

MYRTUS, a genus of plants, the type of the natural order *Myrtaceæ*. *Myrtus communis*, Common Myrtle, has been in all ages a great favourite in Europe. [MYRTLE.]

MY'SIA, the name of an ancient division of Asia Minor, forming the north-west extremity of that peninsula, and bounded on the N. by the Propontis, on the W. by the Hellespont and the Ægean Sea, on the S. by Lydia, from which it was divided by the mountains which separate the valley of the Caícus from that of the Hermus, and on the E. by the river Rhyndacus, which divided it from Bithynia. On the south-east the high land forming the interior of Mysia joins the central table land of Phrygia towards the town of Azani. The Æolians occupied the maritime coast, from the Hermus to the Æsépus, and built their cities there.

Mysia became subject to the Lydian monarchy, after the fall of which it formed part of one of the satrapies of the Persian Empire, which included also Lydia. It was afterwards in succession under the Macedonians, the kings of Pergamus, and the Romans. Under the Romans it formed part of the province called 'Asia.' The principal towns were Pergamus, Cyzicus, Abydos, Lampsacus, and Adramyttium.

MYSORE, a principality in the southern part of Hindustan, lying between 11° 35′ and 15° N. lat., and between 74° 43′ and 78° 40′ E. long. Its greatest length S.E. to N.W. is 210 miles, and its average breadth about 140 miles. It is bounded E. by the Eastern Ghauts, S. by Coimbatoor, W. by the Western Ghauts, and N. by the southern Mahratta country and districts formerly ceded to the English by the Raja of Mysore. The area is about 27,000 square miles, and the population about 3,500,000. The province consists of elevated table-land, with many lofty hills, among which rise several of the rivers which fall into the Bay of Bengal. [HINDUSTAN, vii., 193-4.]

The Rajas of Mysore were for many years actively opposed to the extension of the British power in India, from the time of Hyder Ali Khan, who invaded the lower Carnatic in 1780, to that of his son, Tippoo Saib, who was defeated and killed at Seringapatam, May 4, 1799. Upon this event a large extent of territory was ceded to the British government, who placed on the throne the Maha Raja Krishna Udiaver, then a child only six years old, a lineal descendant of the ancient rajas of Mysore, whose dynasty had been displaced by Hyder Ali. One of Tippoo's ministers was at the same time entrusted with the government, and a treaty was concluded whereby the English undertook to maintain a military force for the defence of Mysore against all invaders, for which service an annual payment was to be made to the Company's government of 280,000*l*. This treaty has continued in operation to the present time.

The city of *Mysore*, the ancient capital of the principality, was about 1770 superseded in this respect by Seringapatam, but it again became the seat of government on the fall of that fortress in 1799. It is situated in 12° 16′ N. lat., and 76° 42′ E. long., about 12 miles S. by W. from Seringapatam. It occupies a considerable space of ground, and is inclosed by a wall. The streets are laid out with some regard to regularity, and the houses are intermingled with temples and trees. The fort is separated from the town by an esplanade, and besides the Raja's palace, contains the dwellings of the principal merchants and bankers.

MYSTERY (*μυστήριον*). In the religion of the Greeks there were rites and doctrines which were kept secret from the mass of the people, and only communicated to a chosen few. These things were called *mysteries*. In modern usage a *mystery* is a doctrine which is incomprehensible by the human understanding, or which appears to involve facts irreconcilable with each other. Thus the doctrine of the Trinity, the union of the divine and human nature in the person of Christ, the consistency of God's perfect foreknowledge and fixed plan of providence with the free-will of man, are spoken of as mysteries.

MYSTICS, a Christian sect which arose in the second century, and whose principles are probably to be traced to the philosophy of the Christian Platonists of Alexandria, Ammonius Saccas and his followers. They first appear as a distinct sect in the 4th century. Adopting the Platonic doctrine, that the human soul is a portion of the divine nature, they held that every man has a divine light within him which is sufficient for his guidance to present and future happiness, but that this light is obscured by the grossness of our material bodies, and by the influence of external objects. Their principles spread extensively in the Eastern church. In the 9th century they were introduced into the West. In the 13th century the Mystics were the most formidable opponents of the Schoolmen, and just before the Reformation nearly all the friends of spiritual religion were included in this sect. In the 17th century, the doctrines of Mysticism were advocated by a Spanish priest, Michael de Molinos, from whose representations of religion, as consisting in the perfect tranquillity of a mind always engaged in communion with God, the sect obtained the new name of *Quietists*; and these opinions were spread in France by the writings of Madame Guyon, were opposed by Bossuet, and defended by Fénélon.

MYTENS, DANIEL, a native of the Hague, where he was born about 1590, was a portrait painter in England during the reign of James I., and previous to the arrival of Vandyck. He was appointed court painter by Charles I. in 1625. Mytens executed many portraits of royal and distinguished personages; and he was in great favour until about 1632, when, on the arrival of Vandyck, Mytens returned to the Hague; and he was still living there in 1656. There are many of his portraits at Hampton Court, of which the full length of James, first Marquis of Hamilton, is an excellent picture.

MYTHO'LOGY (*μυθολογία*). The mythology of a people may be said to consist of those legends and traditions which have been, at some period or other, usually believed by the majority of the nation, but which cannot, on principles of sound criticism, be regarded as historical truths. The term therefore is not confined to the religious systems of the Pagan nations; it includes everything that has been an object of popular belief, not merely

respecting the origin, attributes, and adventures of the gods, but also concerning the early heroes, migrations, and exploits of a people. The historical inquirer has frequently great difficulty in determining at what time the mythology of a nation may be said to cease, and its history to begin; and in fact it is impossible to determine the exact time, since the transition from mythology to history must be gradual; and many traditions, which appear at first sight entirely mythological, may, upon further examination, be proved to contain some great historical truths. The scepticism which calls upon us to reject as mythological everything in the early history of a people which appears to us extraordinary and unaccountable, is as little worthy of respect as the credulity which requires us to believe everything that has been recorded respecting the exploits and adventures of the early heroes of antiquity.

Though a mythological event may be fictitious, it appears that mythology differs from fiction or fable, in having been once generally believed by a people as an account of events which actually took place.

MYTI'LIDÆ; a family of marine bivalve shell-fish, or Conchifers, of which the Mussels, (*Mytilus*) form the type.

MYTILUS EDULIS, the common edible mussel, is abundant along the shores of our island. This shell-fish, though generally wholesome, sometimes produces violent and even fatal effects in those who partake of it, especially in summer. It is not well known to what the violent disease which this mollusk sometimes produces is to be attributed, but the beard or *byssus* has nothing to do with it. (Dr. Burrows, in 'London Medical Repository,' vol. iii. p. 445.) The symptoms have usually commenced between one and two hours after eating, and rapidly attained their greatest intensity. The first symptoms are like those of violent catarrh, swelling and itching of the eye-lids, and generally nettle-rash follows; and the eruption afterwards gives place to symptoms of the most urgent asthma. The swelling is not always confined to the eye-lids, but usually extends over the whole face, and frequently to other parts of the body. It is attended with difficulty of swallowing and speaking freely; numbness about the mouth, gradually extending to the arms, with great debility of the limbs. Epileptic symptoms, or delirium, convulsions, and coma, have in some cases appeared, and proved fatal. Emetics, such as sulphate of zinc, which acts quickly, have been of service; but æther seems the most effectual means of relieving the difficulty of breathing and the other nervous symptoms.

MYXI'NE, a genus of cartilaginous fishes, of the order *Cyclostomi*. It is synonymous with the *Gastrobranchus* of Bloch. The *Myxine glutinosa*, or glutinous Hag, is the type. This curious animal is shaped like an eel, and measures when full grown about one foot and a half. The head is scarcely distinguishable from the body, and is obliquely truncated in front, terminating in a large round mouth, the frame-work of which is a membranous maxillary ring, furnished above with a single tooth. The tongue is furnished on each side with two rows of strong teeth. Eight filaments surround the mouth. In the middle of its superior margin there is a single round spiracle. It has no eyes. The branchial openings are two, and are estimated at about one-fourth the length of the body, below the mesial line. The skin is naked, and very slimy. Along each side of the belly there is a row of pores, which furnish the mucous secretion. An obscure fin runs along the hinder portion of the back, is continued round the compressed tail, and beneath the anal opening, which is placed near the tail. It is of a dark bluish brown colour above, and whitish beneath. The *Myxine glutinosa* is not uncommon in the Scandinavian seas, and is frequently taken off the north-east coast of Britain. It enters the mouths of fishes caught in the nets of the fishermen, and eats up all the fleshy parts of their bodies, leaving only the skin and bones. (Yarrell's *British Fishes*.)

N is one of the liquid or trembling series of letters. It is formed with the tongue at the point where the teeth and palate meet, and the sound passes chiefly through the nasal passage.

The letter *n* is subject to the following changes :—

1. It is interchangeable with *nd*. Thus the Latin roots *men*, *fini*, *gen* (genus), appear in English as *mind*, *bind* or *bound*, *kind* or *kin*.

2. Before *f*, *n* was silent in Latin. Hence the town *Confluentes*, at the junction of the Moselle and Rhine, is now called *Coblenz*.

3. N final often becomes a more complete nasal, or equivalent to *ng*. Thus the German infinitive in *en* appears to be the parent not only of the participle in *end*, but of the substantive in *ung*, with which are connected the English participle and substantive of the same form in *ing*. The Sanscrit alphabet has a particular character for this sound.

4. *Ni* or *ne* before a vowel often forms but one syllable with that vowel, the *i* or *e* being pronounced like the initial *y*. This sound is represented in Italian and French by *gn*, as *Signor*, *Seigneur ;* in Spanish by *ñ*, as *Señor ;* and in Portuguese by *nh*, as *Senhor ;* all derived from the Latin *senior*, elder.

5. *N* is interchangeable with *l*. [See L.]

6. *N* with *m*, particularly at the end of words. [See M.]

7. *On* and *o* are frequently interchanged. Hence the disappearance of the final *n* in the Latin nominatives *ratio*, *ordo*, *Laco*.

8. *N* with *th* and *d*. Thus the Latin often has *en* where the Greek has *αθ* or *ασ*, the English *ood* or *oom*, the German *ut* or *und*, as Greek *μαθ* (in *μανθανω*) and *μεν* (*μενος*), Latin *mens*, English *mood* or *mind*, German *muth* and *wuth*.

9. *N* with *s*. This change will not be readily admitted without consideration, as the sounds appear so different. The change however is very parallel to the admitted change of *l* and *d ;* and indeed as the two latter letters are formed at the same part of the mouth, so are *n* and *s*. The close connection of the two letters will be most forcibly demonstrated by examples of suffixes in which the change occurs. Thus the English language has a double form of the plural suffix in *en* and *es*, as in *oxen* and *asses*. The Greek verb has the same variety; first, in *τυπτομεν* and *τυπτομες ;* secondly, in *τυπτετε*, which must have been the older form of *τυπτετε*, and the so-called dual *τυπτετον*. The Latin again has the *s* for a plural suffix in *scribimus*, *scribitis*, but the *n* in *scribunt*. Again the Latin comparative has for its oldest suffix *ios*, as in *melios*, whence both *melior* and *melius ;* or a better example occurs in *ple-ios* and *pleos*, whence the latter forms *plous* and *plūs*. On the other hand the Greek suffix is *ion*, as *πλε-ιον* and *πλεον*, from the same root as the Latin *plus ;* and with the same meaning. Again, the old genitive plural suffix in Latin appears to have been *sum*, as *servosum*, whence *servorum*. But the Sanscrit has generally *sam*, sometimes *nam*. The suffix for a female in Greek is either *na* or *sa*, with perhaps an *i* prefixed, as *βασιλιννα*, *μελαινα*, *λεαινα*, or *βασιλισσα*, *τυπτουσα*, and in English we have *ess*, while the Germans have *inn*. If the change be admitted, we see the cause of the anomaly in the Latin *pon-o*, *posu-i*, *pos-itum*.

10. *N* before *s* is silent, but lengthens the preceding vowel. This fact is well exemplified throughout the grammar of the Greek language. The Latin has the same peculiarity. Hence *consul* was sometimes written *cosol*, and when abbreviated was always represented by the three first of the sounded letters *cos*. So *censor*, *infans*, *viciens*, *vicensumus*, are often found in the form *cesor*, *infas*, *vicies*, *vicesimus*. The Germans write *gans*, *wünschen*, and the English have *goose*, *wish*.

11. *N* is silent at times before *t* and *th*. The English word *mutton* is derived from the French *mouton* and the Italian *montone ;* and our word *tooth* in the older Gothic dialects was *tunth*, thus corresponding as nearly as it ought to do with the Greek *οδοντ*, and Latin *dent ;* and *mouth* corresponds to the German *mund* and Latin *mentum*.

12. *N* before *v* is silent. Thus the Latin *convention*, assembly, became *covention* (as it occurs in one of the oldest inscriptions), before it was reduced to *contion*, the assembly of the people, a word which modern editors, in spite of all the best MSS. and of etymology, persist in writing with a *c* for the fourth letter. Similarly from *conventu* came the French *couvent ;* and though the English generally say *convent*, yet the name *Covent Garden* is a proof that the *n* was not always pronounced even here.

An initial *n* is sometimes prefixed to and sometimes taken from words by error. Thus *nadder*, a snake, has now lost its *n* through a confusion of the phrase *a nadder* with *an adder*. On the other hand, the phrase *for then once*, i. e. *for this once*, in which the article has its old accusative form *then*, is now written *for the nonce*.

NAARDEN. [Holland.]

NAAS. [Kildare.]

NABIS, tyrant of Sparta, attained the supreme power after the death of the tyrant Machánidas, who was killed about 206 B.C. He proved a cruel despot, and put to death a number of citizens. He allied himself with Philip II. of Macedon, and took possession of Argos and other parts of the

Peloponnesus. After the defeat of Philip, and the peace which followed between him and Rome, the consul Flaminius marched against Nabis, defeated him, but granted him peace, taking his son as hostage to Rome. After the departure of the Romans, Nabis having begun to annoy his neighbours afresh, the Achæans sent against him their general Philopœmen, who drove him back into Sparta, where Nabis was soon after treacherously killed by his own Ætolian auxiliaries, B.C. 192.

NABOB, a corruption of the Hindustani *Nuwwab*, which was the title of the governor of a province under the Mogul Empire, such as the Nuwwab of Arcot, of Oude, &c. (Gilchrist, *Vocabulary.*)

NACRITE, a mineral usually occurring in mica slate, taking the place of the mica; so that the rock becomes a mixture of quartz and nacrite. It is also found crystallised in granite. It occurs in four-sided prisms. Hardness 2.75. Colour silvery. Translucent. Specific gravity 2.793. It occurs in Wicklow, Ireland, and in North America. It consists of silica 64; alumina 29; protoxide of iron 5; water 2.

NADIR. [ZENITH and NADIR.]

NÂDIR SHAH was born Nov. 11, 1688, at the small village of Abuver, in the province of Khorassan. He was of very humble parentage. After having served his country under a petty prince, and plundered it as captain of a band of robbers, he became suddenly patriotic, on the invasion of Persia by the Affghans, who had succeeded, in 1722, in forcing Shah Hussein to abdicate. He raised 5000 men, and succeeded, by 1729, in expelling from Persia her Affghan conquerors. Tâmâsp, the son of Shah Hussein, the Suffavean monarch, succeeded to the throne, and immediately bestowed on Nâdir the government of several important provinces, but Nâdir soon became too powerful for his master. Tâmâsp having been imprisoned through his agency, Nâdir accepted the sovereignty which was then offered to him, in 1736, at a great council which he assembled on the plains of Chowal Mogâm, which was attended, it is said, by 100,000 persons.

Soon after his accession to the throne, in 1736, Nâdir made vigorous preparations for the extinction of the Affghans as a separate power. The city of Candahar fell into his hands in 1738, and many of the Affghans fled into the northern provinces of Hindustan, where they were hospitably received. This caused a war with the Emperor of Delhi, and Nâdir entered the capital city of that province, March 8, 1739, and seized the immense treasures which had been amassed in the course of nearly two centuries by the Mogul monarchs. He then found it necessary, it is said, for the safety of his troops, to order a general massacre of the inhabitants, in which the numbers who perished were 8000 according to the lowest estimate.

Nâdir did not attempt to make any permanent conquests in Hindustan. He returned to Persia in the following year, and directed his attention to the reduction of the nations on the north of Persia. By his conquests in this direction Nâdir completely secured the peace of Persia. He had delivered his native country from the tyranny of the Affghans, and had extended its dominions to the Indus on the east, the Oxus on the north, and almost to the plains of Bagdad on the west. The Turks, who frequently endeavoured during his reign to extend their dominions, were always repulsed with loss; and the Russians were glad to enter into an alliance with this all-powerful conqueror. Hitherto Nâdir had ruled with moderation and justice; but the latter part of his reign was disgraced by acts of the foulest tyranny and oppression. In 1743 his eldest son, Rezâ Kouli, who had distinguished himself by his bravery in various actions, was deprived of sight by order of his father. This and many other actions of treachery and cruelty caused some of the principal officers of his court, who had learnt that their names were included in a proposed massacre, to enter his tent during the night and put him to death, June 19 or 20, 1747. Nâdir was succeeded by his nephew Ali.

The life of Nâdir Shah was written in Persian by his secretary, and has been translated into French by Sir W. Jones. A detailed life is given by Sir J. Malcolm in the second volume of his 'History of Persia.'

NÆVIUS CNEIUS, a native of Campania, and one of the earliest Roman poets, was older than Ennius, and the contemporary of Livius Andronícus. He served in the first Punic war, and afterwards wrote an epic poem on the same, 'De Bello Punico.' He also wrote several dramas in imitation of the Greek, and other comedies on national or Roman subjects. Of all these the titles and a few scattered lines are all that have come down to us. It appears that he had a genius for the satirical, which proved unlucky to him; for having exposed in his plays some of the leading men at Rome, he was imprisoned and banished as an alien. He is said to have retired to Utica in Africa, where he died about B.C. 204.

NÆVUS (*Nævus maternus*, Mother Spot, or Mole) is a congenital mark or morbid growth on a part of the skin. Nævi are of various kinds; some are merely yellowish or brown discolorations of the skin, without any evident alteration in its structure; but the greater number are composed of an excessively vascular tissue, or a dense network of arteries and veins, forming a reddish or livid substance, more or less elevated above the surface of the surrounding skin. A third kind are like extensive warty excrescences, and many of them are covered with thick-set coarse hair. Simple nævi rarely require treatment. Where it is thought desirable to remove them, recourse is had to ligature, cauterization, or excision.

NAGASAKI. [JAPAN.]

NAGPOOR, a district formerly included in the province of Berar, in Hindustan, but now in the adjoining province of Gundwana, of which the city of Nagpoor is the capital. Ellichpoor is the capital of Berar. The palace and seat of government of the Raja of Berar is at Nagpoor, and hence he is as frequently styled the Raja of Nagpoor as the Raja of Berar. The state of Berar, or Nagpoor, is one of those over which the British

authorities hold full political sway, with right of interference in case of mismanagement of the public revenue; and they have a political agent resident at Nagpoor. The area of the state is about 64,000 square miles, the population about 2,500,000, and the estimated revenue 350,000*l*. That portion of Berar which lies to the west of the river Wurdah is included in the territory of the Nizam of Hydrabad; and the title of Raja of Nagpoor is consequently now perhaps a more appropriate title than Raja of Berar, a large portion of the territory of Berar having been transferred to the Nizam after the termination of the Mahratta war.

NAGPOOR, a town in the dominions of the Raja of Berar, or Nagpoor, situated in 21° 9′ N. lat., and 79° 10′ E. long. It stands on a plain 1100 feet above the level of the sea. The town, which is of very irregular form, is about 7 miles in circumference, the buildings being placed in a very straggling manner, as is often seen in India. The greater part of the dwellings are small thatched cottages. Some of the richer inhabitants have large brick-built houses with flat roofs, but the number of these is small, and is continually decreasing through the declining condition of the town. The population is estimated at 30,000.

NAGY-ENYED. [TRANSYLVANIA.]

NAHUM, one of the twelve minor Hebrew prophets, was called the Elkoshite, probably from the place of his birth, but whether this was Helkesi, in Galilee, or Elkosh in Armenia, is disputed. He seems to have prophesied in the kingdom of Judah, towards the close of Hezekiah's reign, about 705 B.C. His prophecy is a complete poem, almost unrivalled for its boldness, ardour, and sublimity. It foretels the destruction of Nineveh and the Assyrian Empire, which events took place in 625 B.C. The canonical authority of Nahum's prophecy is undisputed.

NAIA, Laurenti's name for a genus of highly venomous serpents (*Uræa* and *Aspis* of Wagler).

This genus constitutes the type of a family, or sub-family, of poisonous serpents, peculiar to the Old World, and highly dreaded in India, Egypt, Syria, and Africa. The peculiarity of this formidable group of snakes is, their capability of expanding the skin of the back of the neck, where, from the parting of the scales there, a dark mark, something resembling a pair of spectacles, is represented. The genus *Naia*, or *Naja*, contains several species, as the Cobra de Capello (*Naia tripudians*), a native of India; the Egyptian Cobra or Asp (*Naia Hajé*), and some South-African species or varieties discovered by Dr. A. Smith, besides other Indian species.

The Cobras, as they are now popularly called, are very fierce and daring. When irritated they rise on the tail and lower portion of the body, expand their hood, hiss fiercely, and dart with fury on their opponent. Their danger arises from their poison fangs. They seldom attain to above six feet in length. All agree in habits—lurking among ruins, old fallen walls, logs of wood, &c.

The Egyptian cobra was adopted as symbolical of the protecting deity of the world by the ancient Egyptians, and is sculptured on their

Cobra (*Naia tripudians*).

temples on each side of a globe. From the earliest times a peculiar race of men, called Snake-Charmers, has been in the regions which these cobras tenant. They are mentioned in Scripture, and also by heathen writers; and at the present day snake-charmers pursue their occupation in Egypt and India. That they are able to draw these snakes out of their holes by musical notes is a fact which cannot be fairly confuted. Many animals may be in like manner attracted; but in the feats and mountebank displays which they often exhibit (not always without fatal accidents) the snakes are rendered innoxious, the poison fangs being removed; they will however grow again. The poison of these and all other venomous snakes is fatal only when introduced by puncture. Hence the venom may be taken internally, or sucked from a wound, with impunity, provided there be no abrasion of the skin of the lips or the gums, or other parts of the mouth.

A species of cobra found in Bengal, Bombay, and Assam, *Naia larvata* ('Zoological Proceedings,' 1839), was living some years since in the gardens of the Zoological Society; it fed upon living frogs and earthworms, and drank milk. Colonel Briggs states that the cobras kept by the priests in the temples are pampered with milk and sugar, and will feed out of the hand as tamely as any other domestic animal.

There is a large and dreadful genus of Indian hooded snakes, differing in some dental peculiarities from *Naia*, and remarkable for being the devourers of other snakes, lizards, &c. They swim well, inhabit hollow trees, and frequent the branches. (For an account of one species, *Hamadryas ophiophagus*, see 'Proceeds. Zool. Soc.' 1838). In Ceylon a hooded snake is found 15 or 16 feet long. (Captain Percival's 'Account of the Island of Ceylon.') Its fondness for music, and the fatality of its bite, are commented upon by the author. It is probably a species of *Hamadryas*. [ASP.]

NAI'ADES, or NAYADES, Lamarck's name for a group of Fresh-Water Conchifers (*Naiadæ*), comprising the genera *Unio*, *Hyria*, *Anodonta* (or correctly *Anodon*), and *Iridena*, generally known as Fresh-Water Mussels. The members of

this interesting family are widely spread; many species inhabit the rivers and lakes of Europe, and they abound in the rivers of North America. To the history of these mollusks, Dr. Leach, Mr. Swainson, Dr. Kirtland, in 'American Journal of Science and Arts,' vol. xxvi., and Mr. Lea, have greatly contributed.

Mr. Lea, in his 'Preliminary Remarks,' notices Lamarck's statement that the animal of *Anodon*, which is essentially the same with that of *Unio*, is hermaphrodite, and seems viviparous; for the eggs pass into the oviduct placed along the superior branchiæ, where the young are found with their shells complete. Mr. Lea then tells us that he dissected a specimen of *Anodonta undulata* nearly three inches long, and found the oviducts charged with about 600,000 (as nearly as he could calculate) young, in shells perfectly formed, both valves being distinctly visible with the microscope. In his second volume, bearing the title of 'Observations on the Genus Unio,' &c., the same author informs us that, believing that the oviducts would present the means of discrimination in some species, he having found them to be so very different in *Unio irroratus*, his attention had been particularly addressed to these organs in the few and small species of his vicinity. Whilst engaged in this investigation, Dr. Kirtland, of Poland, Ohio, informed Mr. Lea of his ability to distinguish the female and male shells of the same species, without having recourse to the included animal; and shortly afterwards, Dr. Kirtland's paper on the subject appeared in the 'American Journal of Science and Arts,' vol. xxvi. Mr. Lea's attention now became more addressed to sexual characters, and he states that a very short series of examinations satisfied him fully as to the establishment of the difference of sexes. The female, sustaining her very large burden, naturally requires, he observes, more space within the valves; hence an enlargement of the posterior portion of the shell is generally found, differing in its form in various species.

The *Naiades* (*Les Anodontes* and *Les Mulètes* of Cuvier), according to Mr. Lea, feed on animalcules, or perhaps minute animal and vegetable matters.

The brilliant and variously coloured nacre with which many of the species are lined, and the extreme thickness of some of the shells, are very remarkable. That pearls should be found in them will not surprise those whose attention has been drawn to their internal surface. Pennant remarks that *Mya margaritifera* of Linnæus (*Unio elongatus*) is noted for producing quantities of pearls, and formerly there were regular fisheries in many of our rivers to obtain them. As many as sixteen have been taken from one shell. The Esk and the Conway were famous in this way. The latter river, in the days of Camden, was noted for them. Sir Richard Wynn, of Gwydir, chamberlain to Catherine, queen to Charles II., is said to have presented her majesty with a Conway pearl, which is to this day honoured with a place in the regal crown. Pennant, who states this, adds, that the shells are called by the Welsh, *Crigen Diluw*, or Deluge Shells, as if left there by the deluge. The river Irt, in Cumberland, also produced them; and Sir John Hawkins, the circumnavigator, had a patent for fishing that river. Britain, indeed, had early acquired a reputation for its pearls; for, according to Suetonius, they were Cæsar's inducement for undertaking his British expedition. ('Jul. Cæsar,' c. 47.) This however does not seem very probable. Pliny (ix. 35) indeed speaks of the pearls of our island as small and ill coloured, and refers to the breast-plate which Cæsar himself had brought home and dedicated to Venus Genetrix in her temple, adding that he wished it to be understood that the offering was formed of British pearls.

Ireland has produced pearls of considerable size and some value, especially in the rivers of Tyrone and Donegal. One weighed 36 carats, and was valued at 40*l.*, but it was foul, and so lost much of its worth. Other single pearls were sold for 4*l.* 10*s.*, and one for as much as 10*l.* The last was sold a second time to Lady Glenealy, who put it into a necklace, and refused 80*l.* for it from the Duchess of Ormond. Pennant, who quotes from the abridgment of the 'Phil. Trans.,' speaks of the last century as the time when these large Irish pearls were procured.

As familiar British examples of the *Naiddæ* we may mention the Painter's Mussel (*Unio Pictorum*) and the Fluviatile Anodon (*Anodon fluviatilis*), both common in our fresh waters.

NAI'ADES, otherwise called *Naiadeæ* and *Fluviales*, are aquatic plants forming a small natural order of Endogens, remarkable for the unusual simplicity of their organisation. As they live constantly below water, they require no epidermis, and therefore the leaves consist of nothing more than the mesophlœum, or central stratum of parenchyma. Their sexes are usually separate, and sometimes on different plants.

These plants are inconspicuous objects, inhabiting both fresh and salt water in all parts of the world. In this country the genera *Potamogeton*, a common inhabitant of rivers and ponds, elevating its little brown spikes of flowers above water during the time of fertilisation; *Zannichellia*, a thread-shaped plant, with minute axillary flowers, constantly submerged; and *Zostera*, or sea-wrack, with long, narrow, riband-like leaves, inhabiting æstuaries of the sea, are the most common.

NAIA'DS (Ναιάδες) were female deities in the Greek and Roman mythology, who were supposed to preside over rivers, brooks, and springs. They are represented as young and beautiful nymphs.

NAIL. Until a comparatively recent period almost every kind of nail was produced by hand-labour: each nail, however minute, was separately forged from a thin rod of iron, a process which is still followed in the production of what are technically known as *wrought* nails; and as nails so formed possess certain advantages, for particular kinds of work, over those formed either by casting, or by cutting or stamping out of rolled sheet metal, there is no reason to anticipate the total abandonment of this process, notwithstanding the continual improvement of nail-making machinery.

For some purposes nails formed by the much

cheaper process of casting have been long used. Common cast nails are, however, so clumsy and so brittle that they can only be used for a few coarse purposes, as in plasterer's work, and in the nailing up of fruit trees. By the introduction of great improvements in the manufacture, however, a very useful kind of cast nail, of an exceedingly pure material called malleable cast iron, has been successfully introduced for certain descriptions of woodwork. Nails of this kind are very neat and regular in their appearance, being cast with great accuracy; and they are annealed to such perfection that the metal will bear far more bending than ordinary wrought-iron without injury. This extraordinary degree of tenacity is, however, obtained at the expense of rigidity, such nails being often nearly as soft as copper, and therefore quite unsuitable for use in hard woods.

In the making of cut-nails, the nails are cut from sheet-iron of suitable thickness, which is first reduced, by cutting transversely, into strips or ribands of a breadth equal to the intended length of the nails. These strips are then applied to a machine in which a chisel-shaped cutter descends with sufficient force to cut off from the end of the strip, at each downward stroke, a narrow piece sufficient to form one nail. As the nails are required to be of a tapering form, the cutter must be so fixed as to form a slightly oblique angle to the direction in which the strip is pushed into the machine, and this obliquity must be reversed or varied between each stroke, by means similar to those adopted in comb-cutting machinery.

NAIRN. [NAIRNSHIRE.]

NAIRNSHIRE, a small county in the northern highlands of Scotland, is bounded N. by the Moray Frith, E. by Elginshire, S.E. by a detached portion of Inverness-shire, S. by a detached portion of Elginshire, S.W. and W. by Inverness-shire. It is situated between 57° 21′ and 57° 39′ N. lat., and between 3° 40′ and 4° 5′ W. long. Its greatest length N. by E. to S. by W. is 20 miles; its greatest breadth, at right angles to the length, is 16 miles. The area 200 square miles. The population in 1841 was 9217.

The southern part of the county is hilly; the hills form two irregular groups, separated by the river Findhorn, which flows through the county in a valley called Strathdern. Along the coast, which extends about 8 miles from E. by N. to W. by S., is a narrow border of level country extending inland from one to six miles.

The principal rivers are the Findhorn and the Nairn, both of which rise in Inverness-shire, and flow through the county in a N.E. direction. The Nairn has about 11 miles of its course within or upon the border of Nairnshire, and falls into the Moray Frith at the burgh of Nairn. The Findhorn has about 11 miles of its course in this county, through which it passes to enter Elginshire, where it has its outfall. A number of small streams flow into these rivers, especially into the Findhorn. There are a few small lakes or lochs, of which the largest are Cranloch and the Lake of the Clans.

The hilly part of the county is composed of granite and gneiss rocks; the lower part of the old red sandstone. There is abundance of marl, which is valuable for manure. There is freestone in Nairn parish, and a few men are employed in the quarries. Peat is dug.

The soil is diversified. In the eastern part of the level tract along the coast it is generally a rich loam on a sandy or gravelly bottom: in the western part it is either a stiff rich clay or a sharp gravelly mould. In the mountainous districts it is chiefly a sandy loam, full of gravel and small stones. The climate in this part is cold and stormy, and the crops are later than along the coast, where the temperature is more favourable.

The agriculture of Nairnshire has been much improved of late years. Regular systems of rotation of crops have been introduced; lime has been brought much into use, and attention is paid to the improvement of the breeds of cattle. These improvements are due in a considerable degree to the Nairnshire Farming Society. There are in the county about 8000 acres of natural wood and 4000 acres of plantations. The woodlands are chiefly on the banks of the rivers and their tributary streams.

There are no manufactures carried on in the county except that of woollen cloth, which employs about 50 men.

Nairn, the only town in Nairnshire, is a royal burgh, situated on the west side of the river Nairn, at its entrance into the Moray Frith. The town consists of one principal street parallel to the river, and of a number of smaller streets or lanes branching from it at right angles. It is lighted with gas. The kirk lies back from the main street near the river. The town-hall, a part of which is used as the burgh and county prison, is in the main street. There is a bridge over the Nairn. A small pier was erected some years ago at the mouth of the Nairn, but it has been so much injured by floods in the river and sand driven in by the sea as to be of little use except for very small vessels and fishing boats. Nairn is a place of some resort as a bathing-place, and several villas have been erected in the neighbourhood. Some coal and lime are imported, and a number of boats are engaged in the haddock, cod, and herring fishery. A few small vessels belong to the port of Nairn. Coals, lime, bone-dust, &c., are imported, and wood and corn exported. There is a weekly market. The population of the burgh in 1841 was 2318.

The burgh of Nairn belongs to the Inverness district of burghs, which comprehends Inverness, Fortrose, Forres, and Nairn, and returns one member to parliament.

For parliamentary purposes Nairnshire is united with that of Elginshire, and the two return one member to parliament.

The county was formerly included in the district of Moray. It contains some antiquities, of which the most interesting is Calder or Cawdor Castle, the ancient seat of the thanes of Cawdor. In this building tradition has fixed the scene of the murder of Duncan by Macbeth, and the very bed in which he was murdered is professedly shown; but the tower, which alone remains of the old castle, and to which is attached a more

modern building, is obviously of later date than the transaction connected with it.

NAJAC. [AVEYRON.]

NAKED SEEDS. This name was applied by Linnæus to a small form of fruit which does not directly bear a style at the apex, and which has the appearance of a seed, as in the Sage, the Dead-Nettle, the Borage, &c.: such fruits are now called *Spermidia* by many writers.

NAKHICHEVAN. [GEORGIA.]

NAMEN. [NAMUR.]

NAMUR (*Namen*), a province of Belgium, bounded N. by Brabant, N.E. and E. by Liège, S.E. by Luxembourg, S. by France, and W. by Hainault. Its greatest length from N. to S. is 55 miles, from E. to W. 45 miles; its area is 1401 square miles, and the population in 1846 was 263,430. The province is watered by the Maas, the Sambre, the Lesse, and several small streams. [MEUSE.] The soil of the province is generally fertile, consisting for the most part of an unctuous marl, but without any great depth. Of the three arrondissements into which the province is divided, viz. Namur, Dinant, and Phillippeville, that of Namur is the most productive, the other two being more stony. The principal agricultural products are wheat, rye, oats, barley, hemp, flax, and chicory. The grain harvests do not more than suffice for the consumption of the province. There are few natural meadows in the district of Namur, but in the other parts of the province the meadows are the most profitable of the lands. Artificial grasses are also much cultivated. Wood grows abundantly in the province. The trees are principally oak, beech, ash, hornbeam, birch, and hazel. The breeding of draught horses forms an important branch of rural occupation; they are strong and active, and the farmers are careful to preserve the breed unmixed. Great numbers of swine are bred.

The iron mines of this province, which lie between the Sambre and the Maas, are very productive, and give employment to a large portion of the population. Lead-mines are worked near the city of Namur. A great number of coal mines are worked. Marble is quarried in different parts of the province; it is of various colours, red, gray, blue, and black; the greatest part of what is raised is exported to France. Potters' clay is found. The department is crossed by the Liege-Namur railroad, and by the Sambre and Meuse line from Charleroi to Givet.

Namur, the capital, situated in 50° 28′ N. lat., 4° 48′ E. long., 67 miles by railway S.E. from Brussels, at the confluence of the Sambre and the Maas, has 20,471 inhabitants. It is strongly fortified, entered by eleven gates, and commanded by a strong citadel, built on high ground, from which there is a beautiful view of the town and the two rivers. The streets are wide and clean: the houses are mostly built of a bluish stone, and are slated. There are several squares; two bridges, one over the Maas, the other over the Sambre; and six churches, one of which is a cathedral, dedicated to St.-Aubin. This is a fine building of modern architecture; the front is ornamented with twenty Corinthian columns, sustaining a cornice which bears several statues of white marble. On either side of the great altar are fine statues in Carrara marble, representing St. Peter and St. Paul. The new pulpit in this cathedral is considered a masterpiece of oak carving. The situation of Namur, at the confluence of two navigable rivers, is favourable to commerce. The chief manufactures are—superior cutlery, surgical instruments, tin and brass ware, copper utensils, tools of all kinds, agricultural instruments, ironmongery, and leather. The iron, lead, and coal mines and marble quarries of the neighbourhood, give employment to a large portion of the population. *Andenne*, situated on the right bank of the Maas, near to the border of Liège, has a population of 4314. *Dinant*, likewise situated on the Maas, has a population of 5033, who manufacture woollen cloths, paper, and hats. *Fosse*, a small town about 9 miles S.W. of Namur, has about 3000 inhabitants, who are chiefly employed in the coal-mines and marble-quarries of the vicinity. *Philippeville*, built on an eminence 17 miles W. by S. from Dinant, and fortified, is composed of wide well-paved streets, and has about 1200 inhabitants.

NANCY, once the capital of Lorraine, now of the French department of Meurthe, is situated on the left bank of the Meurthe, 190 miles E. from Paris on the Paris-Strasbourg Railway, in 48° 41½′ N. lat., 6° 11′ E. long., and has 40,542 inhabitants. It is built in a beautiful and fertile plain at the foot of wooded and vine-covered hills, and consists of two parts, the old town on the north and the new town on the south. The old town is irregularly built. The new town has wide and straight streets, lined with good houses. The stateliness of its public buildings, and the extent and beauty of its squares and public walks, render Nancy one of the handsomest of the great towns of France. The Place-Royale is the finest of the squares: one side is formed by the town-hall, containing a gallery of pictures; two other sides are occupied by the prefect's hotel, the custom-house, the theatre, and some private houses. In the angles of the square are four fountains, and in front of the town-hall a triumphal arch in honour of Louis XV. Two streets run in a direct line from this square to two of the town-gates, which are built like triumphal arches. The town possesses several richly ornamented churches. The cathedral is not remarkable except for a portal with a triple row of columns, and for the high altar. The little church of Bon-Secours, in the suburb of St.-Pierre, built over the spot whereon Charles the Rash, the last Duke of Bourgogne fell in battle Jan. 5, 1476, is adorned by the monuments of Stanislas Leckzinsky and his wife. In the old town is the ancient Gothic castle, the former residence of the dukes of Lorraine; and adjacent to it is a small church of Gothic architecture, the burial-place of the ducal family. The tomb of René II. and some others are in the church itself; others are in a round chapel attached to the choir. The other important structures are—the university buildings, in which is the public library of 23,000 volumes; the college buildings; the infantry and cavalry barracks; the theological college; 5 hospitals, one of

which is a house for foundlings; and the public baths.

The inhabitants manufacture hosiery, embroidered muslin, cotton yarn, woollen cloth, calico, lace, oil, chemical products, liqueurs, and leather. Trade is carried on in the various articles manufactured; and in corn, wine, brandy, hides, wool, and iron. There are two yearly fairs, one of which continues twenty days.

Nancy is the seat of a bishop, whose see is the department of Meurthe; of a High Court and University Academy, which have jurisdiction over the departments of Meurthe, Meuse, and Vosges. It has tribunals of first instance and of commerce, a chamber of commerce, a college, a museum, a medical school, a botanic garden, a scientific literary and artistic society, and several charitable institutions.

NANKEEN, a description of cotton cloths, usually of a yellow colour, imported from China, and taking their name from the city of Nankin, in which great quantities of them are made. The peculiar colour of these cloths is natural to the cotton-wool of which they are made, and not the effect of any dye.

NANKING, a city in China, is situated on the south bank of the river Yang-tse-Kiang, in 32° N. lat. and 118° E. long., about 120 miles from the mouth of the river. This town was the capital of the Empire till the end of the 13th century, and was at that time much larger than it is at present. The Jesuits, when surveying the town for the purpose of making a plan of it, found that the circuit of the exterior walls was nearly 20 miles. Ellis ('Journal of an Embassy to China') says that an area of not less than thirty square miles was diversified with groves, houses, cultivation, and hills, and inclosed within the exterior wall, which forms an irregular polygon. But only about one-fourth of this area at present is covered by the town, which occupies that part which is farthest from the river, and is about six miles from its banks.

The town began to decrease when Kublai-Khan removed the Imperial residence to Peking, and still more rapidly when the six great tribunals, which for some time were kept at Peking and Nanking, were attached to the court at Peking. When this took place the name of the town Nanking was changed into that of Kiang-Ning, as it is now always called in public documents, though the people continue to call it Nanking.

The present town consists of four principal streets, running parallel to one another, and intersected at right angles by smaller ones. Through one of the larger streets a stream flows in a narrow channel, and is crossed at intervals by bridges of a single arch. The houses are low, and the streets narrow, but have the appearance of unusual cleanliness.

None of the buildings of Nanking are distinguished by their architecture, except some of the gates, and the famous Porcelain Tower. This building is octagonal. The height is about 200 feet, and each side of the base measures 40 feet. It consists of nine stories, all of equal height, except the ground-floor, which is somewhat higher than the rest. The wall seems to be composed of bricks. On the exterior they are white, and have the appearance of porcelain. At the termination of every story, a roof projects some feet, at the projecting corners of which small bells are fastened, which sound with the slightest breeze. On the summit of the tower is an ornament in the form of the cone of a fir-tree, said to be of gold, but probably only gilt.

The population of Nanking is now supposed to be reduced to 300,000. It has still a great number of manufactures, especially silk, nankeen, paper, and Indian ink, and also carries on a very considerable commerce, being situated in the most populous part of the empire, about half-way between Canton and Peking. Through the ports of Soo-Cheou and Shang-Hae it receives great quantities of corn and other articles. They are brought by water to Nanking, as there are several canals which connect the town with the river. This city is famous as the seat of arts and sciences, and furnishes more doctors and great mandarins than any other city in the Empire. It has also the greatest number of libraries, and the numerous booksellers' shops are well stocked with the best publications.

NANNI, GIOVANNI, called *Giovanni da Udine*, was born at Udine, in 1490. Under the direction of Raphael he executed the greater part of the stuccoes and grotesque ornaments in the loggie and other apartments of the Vatican. He is considered as the most eminent in this branch of the art. After the sack of Rome he visited other parts of Italy, and many of his works are at Florence, Genoa, and Udine. He died in 1561.

NANT. [AVEYRON.]

NANTES, a large seaport town, the capital of the French department of Loire-Inférieure, stands on the right bank and about 30 miles from the mouth of the Loire, in 47° 13′ N. lat., 1° 33′ W. long., at a distance of 240 miles by railway S.W. from Paris, and has 82,389 inhabitants. The city is admirably situated for commerce, having communication with the interior by railway, and by steam boats up the Loire, which forms the harbour of Nantes, and admits at high water vessels of 200 tons up to the quays which line its banks. Vessels of larger size unload at Paimbœuf. The Erdre, which enters the Loire from the north, and the Sèvre-Nantaise, which empties its waters into the Loire just below the town, are both navigable streams. Besides these facilities for traffic, Nantes has communication by canal with Brest. The town is well built, very clean, and well laid-out, especially in the more modern part, which is remarkable for the regularity and elegance of its squares and public places; the Isle Feydeau (which is surrounded by fine quays, and joined to the town by a handsome bridge), the Graslin quarter, and the Place Royale, will bear comparison with the finest parts of Paris. Indeed the quays, which extend 2 miles along the Loire and along both banks of the Erdre, the magnificent river covered with craft of various sizes, the islands, the meadows that stretch along the river bank opposite the town, the bridges across the Erdre and the arms of the Loire, and the harbour of Lafosse, form a striking picture. The quays,

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planted with trees, and backed by large warehouses and other buildings, form very handsome promenades. But the most delightful of the public walks is that formed by the Cours St.-Pierre and St.-André, which run from the Loire to the Erdre, passing the old castle of the dukes of Bretagne: it is formed by four rows of trees, separated by a wide carriage way, and backed by lines of handsome houses; statues of the duchess Anne, Du Guesclin, and other distinguished Bretons, are erected along this walk. The picturesque gable-fronted houses which in the older parts of the town overhang the dark narrow streets, are fast disappearing under modern improvements. In the new parts the streets are wide and well paved; the houses are built of stone and roofed with slates.

The most remarkable objects in Nantes are—the ancient castle, the birthplace of the Duchess Anne, which stands on the banks of the Loire; its chapel is now a powder magazine: the castle of Bouffay, which is now used as a prison: the cathedral of St.-Pierre, the nave and south transept of which alone is finished; the portal entrance, the wood carving, and the stone tracery of the organ loft in the nave, are greatly admired; in the south transept is the splendid mausoleum erected by the Duchess Anne to Francis II., the last duke of Bretagne, and his wife Margaret of Foix: the prefect's residence, the finest modern structure in Nantes: the exchange, which is adorned with several statues: the theatre, which stands in the Place Graslin: the museum of natural history: the picture gallery, which contains several pictures by the great masters: and the public library, which is on the quay Brancas, and contains 30,000 volumes, besides several valuable manuscripts. Nantes contains 33 squares, 450 streets, and 16 bridges. The Place Royale, which presents a figure of nine sides, is formed by as many masses of buildings constructed on a symmetrical plan; the ground floors are occupied as shops, which for elegance and splendor are not inferior to those of Paris or London. The Place Graslin is smaller than the preceding; but it is magnificently built, and contains several fine hotels. Suburbs are built on several of the islands and connected by bridges; and at the mouth of the Sèvre is the suburb of Madeleine, on the south side of the Loire, through which the Bordeaux road runs.

The industrial products of Nantes are, white and printed cottons, cotton twist, refined sugar, ship cordage, glue, chemical products, blankets, serge, flannel, ship biscuits, &c. There are several ship-building yards, copper foundries, tan-yards, brandy distilleries, bleach-mills, and dye-houses. Vessels are fitted out for the whale and cod fisheries. The foreign and coasting trade is active. The chief articles of export are wine, brandy, woollen cloths, silk, paper, linen, gold and silver lace, hardware, prepared meats, provisions, furniture, small wares, books, &c.; the imports are composed of ship timber, planks, hemp, pitch and tar, steel, copper, lead, wool, raw cotton, oil, Spanish wine, cochineal, dye-stuffs, gum, ivory, perfumes, and colonial produce. Other articles of commerce are salt, butter, coal, building stone, hoops, flour, vinegar, and agricultural implements.

Nantes gives title to a bishop, whose see is the department of Loire-Inférieure. It is the head quarters of the 12th Military Division, and contains tribunals of first instance and of commerce, an exchange, a council of Prud'Hommes, a bank, several assurance offices, a custom-house, a mint, a school of hydrography, a college, an ecclesiastical college, a school of medicine, and several literary and benevolent institutions. Foreign consuls reside in Nantes.

Nantes takes its name from the ancient Namnetes, whose capital it was. Among the important events in its more modern history are—the marriage of the Duchess Anne to Louis XII. in 1499, which united Bretagne to France; the issuing of the edict of Henry IV., April 30, 1598, by which the Calvinists were guaranteed the free exercise of their religion; the revocation of this edict by Louis XIV. in 1685; the fierce but unsuccessful attack which the town sustained (June 29, 1793) from the Vendeans under Cathelineau; the unparalleled butcheries committed soon after by Carrier and other republican agents; and the arrest of the Duchess de Berry, Jan. 7, 1832.

NANTEUIL, ROBERT, was born at Rheims, in 1630. He attained great celebrity as an engraver of portraits. Nanteuil died in 1678, and though he lived to the age of forty-eight only, he has engraved nearly 300 plates, almost exclusively portraits. His master-pieces are J. B. van Steenberghen, after Duchatel, known as l'Advocat de Hollande, 1668; M. de Pomponne, after Le Brun; F. M. la Mothe le Vayer, 1661; and Marshal Turenne.

NANTUA. [Ain.]

NANTWICH. [Cheshire.]

NAPHTHA. [Hydrogen, vii., 388.]

NAPHTHALAMIDE. This substance is colourless, inodorous, and insipid. It fuses when heated, and on cooling becomes a fibrous mass. When strongly heated it boils, emitting vapour, which condenses in crystalline plates. It is nearly insoluble in cold water, and but slightly soluble in hot; the solution deposits acicular crystals as it cools.

NAPHTHALASE is pulverulent, of a yellow colour, insoluble in water and alcohol, and nearly so in æther. At 482° it begins to sublime but does not melt; at a higher temperature it fuses and boils; the vapour is of a yellow colour, and it condenses either in yellow scales or needles.

NAPHTHALIC ACID is white, brilliant, and in long feathery crystals, which are four-sided prisms. It melts at 221°, and on cooling concretes into a fibrous mass, and when more strongly heated it volatilizes without decomposition in a pungent white vapour, which is readily combustible. It is devoid of smell, has little taste, is unaltered by exposure to the air, reddens moist litmus paper, is only slightly soluble in cold water, but dissolves to a considerable extent in hot water. It consists of $C^{10} H^2 O^4$.

NAPHTHALIN. [Hydrogen, vii., 388.]

NAPIER, JOHN, of Merchiston, was born a

Merchiston Castle, near Edinburgh, in the year 1550. His name has been variously written. Besides the Latinized forms Neper and Neperus, we meet with Naper, Napier, and Nepair.

Napier's matriculation into the university of St. Andrews took place in the year 1562-3. From the time of his entering the university to the publication of his fanciful 'Plain Discovery of the Revelation of St. John,' in 1593, scarcely any thing is known concerning him. In 1593 he was chosen by the General Assembly one of the commissioners appointed to assemble at Edinburgh to counteract the attempts of the Roman Catholics to put aside Protestantism, then recently established. We are left to conjecture at what time prior to the year 1594 the mind of Napier first became occupied with the discovery of a method which should supersede the long and laborious arithmetical operations which the solution of the most simple trigonometrical problems then exacted. That he was thus occupied in the year 1594 is probable from a letter written by Kepler to Crugerus, dated 1624, wherein, speaking of Napier's Logarithmic Tables, which had then been published ten years, he says, 'Nihil autem supra Naperianam rationem esse puto: etsi quidem, Scotus quidam, literis ad Tychonem anno 1594 scriptis, jam spem fecit canonis illius mirifici.' (Kepl., 'Epist.,' Lips., 1718, fol., p. 460.) The Scotchman here alluded to was Dr. Craig, of whom a circumstance is related by Wood, in his 'Athenæ Oxonienses,' under the article 'Briggs,' upon the authority of Oughtred and Wingate, and cited by several authors with reference to Napier's invention. The substance is this:—Craig, coming out of Denmark, called on Napier at Merchiston and informed him, among other things, of a rumoured discovery by Longomontanus, 'as 'tis said,' whereby the tedious operations of multiplication and division in astronomical calculations were avoided; and intimated that this was effected by means of proportional numbers, of which information Napier availed himself so skilfully, that upon Craig repeating his visit a few weeks after, he showed him a draught of what he called 'canon mirabilis logarithmorum.' The correctness of this story, as regards Longomontanus, is disproved by the fact that Longomontanus attributes the invention to Napier. There appears however to be no doubt that Craig did write to Tycho Brahe at the time stated, acquainting him with the progress which Napier had then already made.

His Tables were published in 1614. The principle of their construction Napier at first withheld, 'waiting the judgment and censure of mathematicians before exposing the remainder to the malignity of the envious.' This explanation was given in a posthumous work, edited by his third son Robert, and published in 1619.

From the date of the publication of the Logarithmic Canon until the death of Napier, which took place the following year, there is little recorded of him which demands particular notice, except his connection with Briggs. [Briggs.] His 'Rabdologiæ, seu Numerationis per Virgulas, libri duo,' Edinb., 1617, 12mo., was the last of his literary productions. [Napier's Bones.]

Napier died at Merchiston on the 3rd or 4th of April, 1617, Old Style, and was interred in the cathedral church of St. Giles at Edinburgh. He was twice married.

On Napier's improvements in trigonometry it is sufficient to mention the elegant theorems known as Napier's 'Analogies,' and his theorem of the 'five circular parts,' which furnishes a ready solution of all the cases of right-angled spherical triangles.

The only work of Napier not already mentioned is a letter to Anthony Bacon, entitled 'Secret Inventions profitable and necessary in these Days for the Defence of the Island, and withstanding Strangers, Enemies to God's Truth and Religion.'

NAPIER'S BONES, or RODS, a contrivance of Napier to facilitate the performance of multiplication and division, explained by him in his 'Rabdologia,' published in 1617. The invention would have been perhaps more employed, but for his discovery of logarithms. See the description of them in the *Penny Cyclopædia*.

NAPLES, KINGDOM OF, is the name commonly given to the Continental part of the united kingdom of the Two Sicilies. This fine region occupies the southern half of the Italian peninsula, being bounded on the north-west by the Papal State, and on every other side by the sea. The frontier line between the kingdom of Naples and the Papal State begins on the coast of the Mediterranean, at the tower 'Dei Confini,' which is a mile or two south-east of Terracina, where the mountains recede from the sea, and at the opening of the basin of the lake of Fondi; and, towards the east, the line follows an offset which skirts the right bank of the Tronto, and afterwards, below Ascoli, the river itself forms the boundary down to the Adriatic. Four roads, which are ultimately reduced to two, lead into the kingdom, by way of Terracina, Palestina, Rieti, and Ascoli.

The greatest length of the kingdom of Naples, from the Tronto to Capo Spartivento at the southern extremity of Calabria, is about 400 miles, in a curved line running through the centre of the peninsula. Its breadth from sea to sea varies from 83 to 130 miles; but the peninsula of Calabria is in one part only 14 miles across. The area is 31,600 square miles. The population in 1845 amounted to 6,382,706.

The main features of the physical geography of the kingdom are—1. The Apennines, which run through the centre of the country. [Apennines.] 2. Two extensive plains, Apulia and Campania, the former to the east and the other to the west of the Apennines. 3. Numerous valleys between the offsets of the Apennines. 4. A strip of low land along the coast between the base of the mountains and the sea, varying in width from ten miles to one mile, and in some places even less. This low region is hot and naturally fertile, but unwholesome in many parts and exposed to inundations from the mountain-torrents.

The principal basins or water-systems are—1. That of the Liris, or Garigliano, which is about 60 miles long; it includes the courses of the Fibreno, Melfa, Rapido, Frigido, and other affluents.

West of the basin of the Garigliano, and separated from it by the mountains of Itri, is the small basin of Fondi, containing a low plain of about 50 square miles in extent, and drained by the small river Vetere. 2. The basin of the Volturno includes that river and the Calore, which drain an area of nearly 3000 square miles. 3. The fertile plain east of Mount Vesuvius and between it and the Apennines forms a small basin, which is drained by the river Sarno. 4. The basin of the Sele and its affluent the Tanagro includes the greater part of the province of Principato Citra and a part of that of Basilicata. 5. The basin of the Crati in Calabria Citra. 6. The basin of Basilicata, with its four parallel rivers, the Agri, Sinno, Bradano, and Basiento, is described in the article BASILICATA. 7. The Ofanto has a course of about 70 miles. 8. The great plain of Apulia is drained by the Carapella, Cervaro, and Candelaro, the courses of which are nearly parallel, and run from the central Apennines to the sea. 9. The Abruzzi and its rivers are noticed under ABRUZZI. 10. The basin of Lake Fucino, or Celáno, in the centre of the peninsula, is surrounded by mountains on every side. The lake, which is 16 miles long and 9 miles broad, receives the waters of about 400 square miles, which it discharges by a tunnel into a neighbouring province.

The kingdom of Naples has a coast-line of about 1500 miles in length, two-fifths of which lie on the west or Mediterranean sea, and the rest on the Ionian and Adriatic seas. From the deficiency of tides in the Mediterranean, the harbours are mostly shallow and inconvenient. The best are those of Baiæ, Naples, and Gaëta, on the west coast, and Taranto, Brindisi, and Bari on the east coast.

The productions of the soil throughout the kingdom are various. The staple products are corn, wine, oil, wool, and silk. The plains of Apulia produce vast quantities of corn and wool for exportation. Gallipoli is the great oil mart. Silk is made in Calabria, in Abruzzo Citra, Terra di Lavoro, and Principato. Cotton is produced in the provinces of Bari, Principato, near Castellamare, and other places. Wine is made all over the kingdom, and in great abundance and variety, but most of it is consumed in the country and within the year. Some brandy is made and exported to America. The country produces most kinds of fruit, such as figs, chestnuts, almonds, oranges, lemons, pomegranates, melons, peaches, and apricots. Tobacco is cultivated chiefly near Lecce, saffron in Abruzzo, and the sugar-cane in Calabria. Flax, hemp, and rice are also raised in considerable quantity in the low grounds. Indian corn is also much cultivated. Cheese is made chiefly in Abruzzo and Apulia. In some favoured spots, such as in the neighbourhood of Naples, at the foot of Mount Vesuvius, near Monteleone and Reggio in Calabria, the fertility of the soil seems inexhaustible. A little coal and iron are found. The forests have been much neglected. The strip of maritime low land is in many places marshy and covered with underwood. Herds of black cattle, buffaloes, and pigs, live in that unwholesome region. Something has been done of late years towards draining the marshes.

Good roads have been made in various parts of the kingdom during the present century.

The kingdom is divided for administrative purposes into 15 provinces, the names and chief towns of which are as follows:—Provincia di Napoli, *Naples;* Terra di Lavoro, *Caserta;* Principato Citra, *Salerno;* Principato Ultra, *Avellino;* Sannio, *Campobasso;* Abruzzo Citra, *Chieti;* Abruzzo Ultra Primo, *Teramo;* Abruzzo Ultra Secondo, *Aquila;* Capitanata, *Foggia;* Terra di Bari, *Bari;* Terra d'Otranto, *Lecce;* Basilicata, *Potenza;* Calabria Citra, *Cosenza;* Calabria Ultra Prima, *Reggio;* Calabria Ultra Seconda, *Catanzaro.* The provinces are divided into districts, and the districts into communes. Each province is administered by an 'intendente,' or king's lieutenant, appointed by the king, and changed every three years. In every province there is a 'Consiglio provinciale,' or a council of notables. Every commune has a sindaco, who corresponds to the maire of the French communes. A communal council, called 'Decurionato,' chosen by ballot from among the notables or proprietors, fixes the local rates, administers the revenue, and appoints the municipal officers, subject however to the sanction of the intendente.

The judicial department consists of four 'Gran Corti Civili,' which sit at Naples, Aquila, Trani, and Catanzaro; a criminal court, and a civil court in every head town of a province; and a judge of instruction in every district, and a justice of peace, 'giudice di circondario,' in every 'giudicatura inferiore,' of which there are 525 in the whole kingdom. A supreme court of cassation, 'Corte Suprema di Giustizia,' sits at Naples. Trials are public in the kingdom of Naples, as in France. The French Civil Code, with some modifications, has been retained, as well as the French Commercial Code.

For the purposes of public instruction, there is an elementary school in every commune; grammar schools, 'scuole secondarie,' in most towns; a royal college in every head town of a province; five lycea at Naples, Salerno, Aquila, Bari, Catanzaro; and, lastly, the university of Naples.

The ecclesiastical establishment consists of 20 archbishops and 65 bishops, 72 clerical seminaries, and 3767 rectors of parishes. The number of priests, monks, and nuns is very great. The Roman Catholic is the exclusive religion of the country.

The history of the kingdom is given under SICILIES, TWO, KINGDOM OF THE.

The inhabitants of the countries composing the kingdom of Naples are derived from various and mixed races. The descendants of the ancient Samnites, Peligni, Marsi, Frentani, Lucanians, and other people of old Italian origin; the Etruscan Campanians, the wild Bruttii, and the Greek population of the coasts, combined with Romans and Latins to form the present Neapolitans. The Longobards, the Normans, the Spaniards, and other foreign nations, have aided in the formation of the national character.

NAPLES, PROVINCE OF, is the name of

the metropolitan province of the kingdom of the Two Sicilies, which includes the capital and the territory round the bay from Cape Misenum and Cuma on the west to Castellamare and Sorrento on the south-east. The islands of Ischia and Procida belong also to the province of Naples. The province is divided into four districts: 1, Naples; 2, Pozzuoli, which includes the whole western division and the islands; 3, Castellamare, which comprises the territory at the base of Mount Vesuvius, and the coast opposite Naples as far as Sorrento; 4, Casoria, which comprehends a tract of the Campanian plain stretching north of the range of hills behind the city of Naples.

The principal towns of the province of Naples, exclusive of the capital, NAPLES, are: 1, *Pozzuoli*, the ancient Puteoli, is a bishop's see, but a poor-looking town, with 10,000 inhabitants. 2, *Afragola*, a large village or town of 13,000 inhabitants, N.E. of Naples in the Campanian plain, has some hat manufactories. 3, *Fratta Maggiore*, near the ancient Atella, is famous for its strawberry beds, which supply the markets of Naples. 4, *Somma*, at the north base of Mount Vesuvius, has 7000 inhabitants. 5, *Sant' Anastasia*, near Somma, has 6000 inhabitants. The whole neighbourhood produces the luscious wine known by the name of 'Lachryma Christi.' 6, *Portici* and *Resina*, two adjoining towns built on the south-west slope of Vesuvius, on the site of Herculaneum, contain together about 14,000 inhabitants. 7, *Torre del Greco*, about two miles south-east of Portici, at the foot of Vesuvius, a town of 13,000 inhabitants, has been repeatedly destroyed by the lava and earthquakes, but rebuilt over and over again. 8, *Torre dell' Annunziata*, about four miles south-east of Torre del Greco, and near the site of Pompeii, has 9000 inhabitants, and manufactures of muskets, gunpowder, and maccaroni. 9, On the east slope of Vesuvius is the town of *Ottajano*, with 15,000 inhabitants. 10, *Castellamare*, at the south-east extremity of the Bay of Naples, is in a delightful situation on the sea-coast, at the foot of the lofty mountain St. Angelo: it has docks for the royal navy, several sources of mineral water in the neighbourhood, a royal villa called 'Quisisana' and park, and about 10,000 inhabitants. 11, *Vico*, a small town perched upon the cliffs above the coast, about 4 miles south-west of Castellamare. 12, *Sorrento* has 5000 inhabitants, is a bishop's see, and was the birth-place of Tasso.

NAPLES (*Napoli*, in Italian), the capital of the kingdom of the Two Sicilies, and the fourth in population among the European cities, is situated in 40° 50′ N. lat., and 14° 13′ E. long., on the northern coast of the fine bay of the same name, and partly at the foot and partly on the slope of a range of hills.

Seen from the sea Naples appears in the form of two crescents, of very unequal depth, one on the east, and the other on the west, divided by the point of Castel dell' Uovo and the hill of Pizzofalcone, which is behind it. The eastern crescent, which includes the great bulk of the city, faces the south-east, and is bounded by the hill of Capodimonte to the north, and Sant' Elmo or Ermo to the west, crowned by the castle of that name, which commands the town. Between these two hills is a considerable depression, on which the suburbs of La Sanitá and L'Infrascata are built. The slope of the hill of Capodimonte is likewise covered with houses, forming the suburbs called Miracoli and Le Vergini. To the eastward the town is open to the plain of Campania. From the barrier of Capo di Chino, at the entrance from Rome, a succession of fine streets run through the body of the town to the sea, the principal of which, called Toledo, about a mile in length, runs due south, and divides the old city, which is east of it, from the new districts. The street of Toledo terminates in the Plaza before the royal palace. The old city forms a closely built square of about a mile on each side. Part of its walls, towers, and ditches still remain, and several of the gates are standing. This part of the town, which is in a plain, has narrow streets and lofty massive houses, many of them six or seven stories high; it is very thickly inhabited. West of Toledo numerous streets run up the hill of Sant' Elmo. South of the hill of Sant' Elmo, and between it and the point of Pizzofalcone, is another depression, which affords a carriage communication between Toledo and the western crescent, or new part of the town, which is called by the general name of Chiaja, 'the quay.' This part, which is much contracted between the hills and the sea, extends in length about a mile and a half between the hill of Pizzofalcone to the east and that of Posilipo to the west. There are two fine roads to Pozzuoli. The extreme dimensions of the city are 3½ miles by 2 miles.

Few buildings at Naples are in a good architectural style; they are either overloaded with ornaments or disproportionate in their parts. The most remarkable are—

1. The royal palace, 'La Reggia,' a large mass of buildings, 400 feet in length, with three orders of pillars, one above the other, Doric, Ionic, and Corinthian. The palace contains a number of fine pictures, the royal printing-press, and the royal porcelain manufactory. Near the palace are the arsenal, the cannon-foundry, the wet-dock, the Castel Nuovo, and the grand opera house. 2. The palace, museum, and library, called 'Degli Studj,' are in the northern part of the town, at the foot of the hill of Capodimonte; this museum (the Borbonico) is one of the richest in Europe in sculptures; and the library contains a fine collection of works. 3. The churches of Naples amount to about two hundred; but in general they are remarkable for their monuments, paintings, and other accessories, rather than for their architecture. The cathedral, begun by Masuccio, a Neapolitan architect and sculptor of the 13th century, has been since repeatedly altered, ornamented, and spoiled. The interior is rich in ancient columns of valuable marbles; it also contains a splendid mausoleum of Charles I. of Anjou, the conqueror of Naples. The adjoining chapel of San Gennaro is rich in paintings. The remaining churches contain many valuable paintings and sculptures. 4. The royal palace of Capodimonte is a heavy structure, but is remarkable for its fine situation, the excellent road leading to it, con-

structed by the French, its extensive park and hunting grounds, and the adjoining observatory. On the slope of the hill is the Chinese College, for the education of young Chinese, who, after taking holy orders, return to their country as missionaries. On another part of the hill of Capodimonte is the botanical garden.

Naples has many charitable institutions, such as the great hospital Degli Incurabili; the foundling hospital; the school for the deaf and dumb; the asylum for the blind; the Reclusorio, or general workhouse for able-bodied poor, with a school annexed to it, and which contains about 3000 poor; San Gennaro dei Poveri, for the poor who are unable to work, San Francesco di Sales, and several other minor hospitals and houses of refuge. There are, among educational establishments, a university, a medical college, a veterinary college, two military schools, a college of pilots, and the Conservatorio, or school of music.

The population of Naples in 1845 was 379,621. Naples has manufactures of hats, straw-hats, gloves, leather, earthenware, coral, and jewellery. There are about 700 hackney-coaches, 600 cabriolets, 1600 boats, and about 500 vessels, belonging to Naples. The town is divided into twelve 'quartieri,' or districts, of which each has a commissary of police. There are sixty-six military posts in the whole town, besides four castles, and extensive barracks both for infantry and cavalry. The town has six prisons, one of which is for debtors. The palaces of the nobility are spacious and massive, but few of them are in a good architectural style. The most remarkable are the palazzo Gravina or Orsini, the palace Maddaloni, that of Sansevero, that of Della Rocca, those of Francavilla, Stigliano, Berio, &c. Naples is not so well supplied with water as Rome, and has not such handsome fountains; those of Fontana Medina and Monte Oliveto are the best. The neighbourhood abounds in delightful walks. The town is abundantly supplied with provisions of every kind; fish and shell-fish are plentiful, as well as vegetables and fruits. Snow, of which a great quantity is used, especially in summer, for cooling the drink and for ices, is brought from the mountain of Castellamare, where it is kept in large reservoirs.

Naples, or Neápolis, that is, 'New City,' was a Greek colony from Cumæ. The date of its origin is not known. It received colonists from Chalcis, Pithecúsa, and Athens; and subsequently admitted some Campanians also among the body of citizens. (Strabo, p. 246. Casaub.) It became allied to the Samnites, but after their subjugation by Rome it maintained its independence as a republic, and during the second Punic war sent ambassadors to Rome to propose an alliance against Hannibal, and with it a rich present in golden vases, which the people took from their temples to defray the expenses of the war. (Livy, xxii. 32.) It continued afterwards an ally to Rome and became a municipium. After the fall of the empire, Neapolis was taken by the Goths, retaken by Belisarius, and lastly destroyed by Totila, A.D. 543. It was afterwards rebuilt, and was governed successively by the Longobards, the native dukes, and the Normans. Naples was one of the last towns which submitted to the Normans; it acknowledged King Roger I. of Sicily, as its sovereign, about A.D. 1137.

NAPOLEON. [BONAPARTE.]

NA'POLI DI MALVASIA (*Monembasia*) is a town built on the small island of Monembasia, on the east coast of Laconia, and connected with the mainland by a bridge. About 4 miles N. of the bridge are the ruins of Epidaurus Liméra. As Epidaurus fell into decay, the town on the island grew into importance, and it then probably assumed the name of Neápolis. It was a place of some consequence under the Byzantine emperors, and Andronícus Comnenus in the 12th century founded here a monastery, which still exists. The town, which is a poor place with narrow steep streets, and about 400 houses, including those on the summit of the hill near the castle, gives title to a Greek archbishop. The country in the neighbouring district formerly produced a luscious wine, to which the English gave the name of *Malmsey*.

NA'POLI DI ROMANI'A (*Naúplia, Anapli*), a town of the Morea, built on a rocky promontory at the north-east extremity of the Argolic Gulf. The harbour between this promontory and the north coast is large and tolerably safe, but too shallow to admit large ships. The town stands on the north-east slope of the hill facing the mainland, and is fortified; the hill has a tabular summit, which is unoccupied with houses, and from which abrupt cliffs descend to the open sea at the back of the promontory. A steep and rocky mountain rises above it to the south-east called Palamedi; on this cliff is a strong castle. Nauplia was once the port and arsenal of Argos, but in the time of Pausanias it was deserted. It was occupied by the Venetians in the 13th century, and became their chief settlement in the Morea, until it was taken from them by Sultan Solyman in 1537. After the Greek insurrection it remained for several years the head town of Greece, until it was superseded by Athens. Its population, which had risen to about 12,000 has recently declined. The streets are irregular and dirty, and the air is not wholesome. The Greek bishop is styled Bishop of Argos and Anapli. An aqueduct of good water from the rocky ridge near Tiryns supplies the town.

NARBONNE, a city in the French department of Aude, stands near the coast of the Mediterranean, in 43° 11′ N. lat., 3° 0′ long., 5[illegible] miles S.W. from Montpellier, and has 11,907 inhabitants. Narbonne is one of the oldest cities of France. It is the *Narbo-Martius* of the Romans, who planted here their first colony west of the Alps in 112 B.C. But in vain is any monument of its ancient splendour sought for. Time, ignorance, and war, have swept away every trace of its Roman structure, with the exception of a few fragments of capitals and marble slabs with inscriptions.

The town is situated upon the Robine Canal, a branch of the Canal-du-Midi, by which a portion of the waters of the Aude flow into the Mediterranean. It is surrounded by an old wall pierced

by 4 gates, and defended by several bastions and towers. The canal divides it into two parts, between which there is communication by three bridges. Along the bank of the canal is a public walk planted with trees. The cathedral of St.-Just, founded in 1272, and finished only within the last 10 years, is a handsome gothic church; it has a splendid nave and choir, which are richly ornamented with good sculptures, and contain several marble monuments. Philippe III. of France was buried in the choir, but his monument has now disappeared. The other principal structures of Narbonne are—the church of St.-Paul, the archbishop's palace, the barracks, and the 3 hospitals. The city has tribunals of first instance and of commerce, a custom-house, an ecclesiastical college, a theatre, and a school of hydrography. The chief industrial products are brandy, verdigris, bricks, tiles, pottery, linen, leather, and paper. The inhabitants trade in corn, wine, brandy, oil, salt, soda, wax, and excellent honey. [AUDE.] Narbonne has given title to an archbishop since A.D. 419; the see however is now united to that of Toulouse, the prelate being styled archbishop of Toulouse and Narbonne.

NARBOROUGH, SIR JOHN, an English naval commander, was descended from an old family in Norfolk, and received his first commission, as lieutenant of the Portland, in 1664. He distinguished himself under Prince Rupert and Monk in the fight of June 1666 against De Ruyter and Van Tromp, and, after the conclusion of peace, he was selected to conduct a voyage of discovery to the South Seas. He returned home in 1671. Captain Philip Parker King, in speaking of the early navigators who explored the Strait of Magalhaens, observes that 'among the numerous plans of it that are extant, those of Sir John Narborough and Cordova are the most correct.'

On the breaking out of the second Dutch war in 1672, he was taken by the Duke of York into his own ship, the Prince, as second captain. After distinguishing himself in the obstinately contested battle of Solebay, he was raised, in 1673, to the rank of rear-admiral, and received the honour of knighthood. In 1674 he was appointed commander-in-chief of a fleet sent to the Mediterranean, for the purpose of overawing Tripoli and other piratical states. He acquitted himself with so much success in this duty, that he compelled the Bey of Tripoli to release all his British captives, and to pay 80,000 dollars in reparation for injuries to the British trade. Sir John Narborough returned to England in 1677: but was almost immediately despatched again to the Mediterranean, in command of another fleet, with a similar commission to chastise the piracies of the Algerines. He concluded a series of brilliant operations by capturing and carrying into Cadiz five Algerine frigates. In the following year he was made a commissioner of the navy, and continued to hold that office until his death, which occurred towards the close of 1688.

NARCEIA, an alkali procured from opium by Pelletier in 1832. It crystallises in colourless acicular four-sided prisms, is inodorous, has a slightly bitter taste, dissolves sparingly in water. At about 198° it melts, and on cooling it concretes into a white translucent mass, exhibiting appearances of crystallisation.

NARCISSUS is a genus of Endogens belonging to the natural order *Amaryllidaceæ*, among which it is known by its flowers growing upon a scape, and having a cup at their mouth; the stamens which are opposite the sepals being longer than the others. It consists of bulbous plants, principally inhabiting the warmer parts of Europe, only one species, *N. pseudo-narcissus*, or the Common Daffodil, being found plentifully so far north as Great Britain, with two others, *N. biflorus* and *N. poeticus*, in a wild state.

NARCOTICS (from the Greek adjective ναρκωτικὸς, which is from νάρκη, a stiffening, stupor, or insensibility), a class of medicines which may be defined as agents which, in moderate doses, cause a temperate increase of the action of the nervous and also of the vascular system, followed more or less speedily by a marked diminution of this action, terminating generally in sleep. When the dose is large, the excitement is scarcely perceptible; while the diminished power of the nervous system is so manifest, that an appearance of coma or apoplexy is induced. All the agents included in this class are capable of producing a state termed narcosis, or narcotism, which, if not quickly removed by a natural subsiding of their influence, or by artificial means, may terminate in death. Many of them are therefore as familiarly known as poisons as therapeutic agents. Their power of inducing sleep has procured for them the name of hypnotics, or soporifics; and the property which many of them possess of alleviating pain, by blunting the sensibility, has obtained for them the appellation of anodynes, or, from one of the best known among them, simply of opiates.

The most important consideration respecting them is the circumstance of their depressing action being always preceded by a stimulant. This peculiarity renders their employment difficult in some cases and improper in others. Diversified as narcotics are in their nature and modes of action, there is this common property, that they all make a direct impression on the extremities of the nerves (to whatever part of the body, with few exceptions, they are applied); but their full and ultimate effects do not take place till they are absorbed, and mingled with the circulating fluid.

No set of medicines have their action more modified by a variety of circumstances—such as the quantity given, or the frequency of repetition, also the force of habit, climate, or season, but above all by idiosyncrasy. Age also has an important share in determining the amount of action. Children do not in general bear them well, and therefore though they are very subject to convulsive and spasmodic diseases, other means should be employed, especially the removal of the source of irritation, when practicable. The various nostrums recommended for children generally contain some narcotic, and prove a fertile cause of the mortality of early life. The administration of narcotics requires more knowledge and judgment

than that of any other class of remedies, and should only be had recourse to under competent advice.

NARCOTI'NA, an alkaline principle found in opium. It is procured in light white flocks, or in pearly acicular crystals. It is insoluble in cold water and very sparingly soluble in hot water; its taste is not bitter.

NARDI, JA'COPO, born at Florence in 1476, served first in the troops of the republic, and afterwards in a civil capacity. He was sent in 1527 as ambassador to Venice. He died at a very advanced age, after the fall of the republic. He wrote 'Storia della Città di Firenze dell' anno 1494 al 1531,' published at Lyon in France, 4to., 1582: another edition was published at Florence in 1584. His history forms a sequel to that of Machiavelli.

NARDO'STACHYS, a genus of plants belonging to the natural order *Valerianeæ*. The species are herbs with sweet-scented roots. *N. Jatamansi* is a native of Nepaul, on the Himalaya Mountains, and in Delhi, Bengal, and the Deccan. This species is the true Spikenard of the ancients, and is esteemed not only as a perfume, but as a stimulant medicine. Oriental writers give it as a remedy for a multitude of diseases, and it seems to be really valuable in cases of epilepsy and hysteria.

NARDUS. [SPIKENARD.]

NARES, JAMES, Mus. Doc., was born at Stanwell in Middlesex, in 1715, and received his musical education under Bernard Gates and Dr. Pepusch. At an early age he was chosen organist of the cathedral of York, and in 1756 was appointed organist and composer to George II. About the same time the degree of Doctor in Music was conferred on him by the University of Cambridge. In 1757 he succeeded Mr. Gates as master of the children of the Chapels-Royal, which office he held till 1780. He died in 1783.

He published several musical works, the most important of which are:—'Twenty Anthems in Score, composed for the use of the Chapels-Royal,' and now constantly heard in every cathedral in England and Ireland; 'A Collection of Catches, Canons, and Glees,' dedicated to the Earl of Mornington, including the prize-glee, 'To all Lovers of Harmony,' and 'Fear no more the Heat of the Sun;' 'A Treatise on Singing,' with a set of English duets; and 'The Royal Pastoral, a Dramatic Ode.'

NARNI. [SPOLETO-ET-RIETI.]

NARSES. His origin and parentage are unknown. He was probably by birth an Asiatic, emasculated, and sold, according to the custom of that part of the world, and employed in his youth in menial services in the imperial household of Constantinople. His natural abilities and insinuating manners attracted the attention of Justinian, who employed Narses about his person, and finally raised him to the office of keeper of the emperor's privy purse. Narses was sent on several missions, and at last, in A.D. 538, he was appointed to the command of a body of troops which were sent to Italy to act under Belisarius. The two generals acted in concert at first, and obliged the Goths to raise the siege of Ariminum; but they soon quarrelled, and Narses, who was supported by a party at the court of Justinian, chose to act for himself: the consequence was, that Belisarius was cramped in his operations, and meanwhile the Goths and Burgundians took and ravaged Milan. In 539 Justinian recalled Narses, who resumed his places at the imperial palace. Several years after, Belisarius having been recalled from Italy, the state of that country fell again into utter confusion. In 552 Justinian appointed Narses commander-in-chief of the Italian expedition, and supplied him plentifully with money, with which he collected a number of auxiliaries, Heruli, Longobardi, Gepidæ, and others, whom he assembled near Salona. He marched along the shores of the Adriatic, through Dalmatia, Istria, and Venetia, and arrived at Ravenna, from whence he moved on across the Apennines, and met Totila, who was advancing from Rome, at a place called Tagina, or Tadinæ, where a desperate battle took place, in which the Goths were completely defeated and Totila was killed. Narses advanced to Rome, which he took, whilst the Goths, having retired to Pavia, elected for their king Teias, who moved with a fresh army to encounter Narses. The two armies met on the banks of the river Sarno, near Nocera, in Campania: Teias was killed in the fight, and the remaining Goths entered into a convention with Narses, by which they laid down their arms and withdrew to North Italy, where they dispersed. Not long after however part of them joined a host of Franks and Alemanni who had crossed the Alps, and the whole made an irruption into South Italy whilst Narses was besieging Lucca. The barbarian host advanced as far as Calabria, plundering and committing all sorts of excesses; but on returning northwards loaded with booty they were met by Narses on the banks of the Volturno, and totally destroyed. The Gothic kingdom in Italy was now at an end, and the whole country acknowledged the authority of Justinian, who appointed Narses exarch of Italy, A.D. 553. Narses fixed his residence at Ravenna, and during his fifteen years' administration he checked the licentiousness of his troops, dismissed the most turbulent of his barbarian auxiliaries, appointed governors, with the title of dukes, to the different provinces, and repressed faction and religious schism. He is charged with accumulating a large treasure during his residence in Italy. After the death of Justinian, A.D. 565, the enemies of Narses obtained his recall from the emperor Justinus II., who sent Longinus to supersede him as exarch of Ravenna. Narses, after giving up his command, withdrew to Naples, but soon after, upon the urgent application of the Roman people, forwarded through their bishop, he removed to Rome, where he died at a very advanced age, A.D. 568.

NARTHE'CIUM, a genus of plants belonging to the natural order *Juncaceæ*. *N. ossifragum*, the only British species, is distinguished especially by its seeds. It is found in turfy bogs.

NARVA, the chief town of the circle of Narva in the government of St.-Petersburg, is situated

on the west bank and about 10 miles from the mouth of the Narowa, and has about 5000 inhabitants. It is surrounded with a rampart, and in the suburb of Ivangorod there are the remains of a large fortress built by the czar Ivan Wassiliewitsch. The houses of the town are well-built of brick, and stuccoed. The inhabitants trade in balks, planks, flax, hemp, corn, and furs. The fishery in the Baltic is very productive, and the lampreys and smoked salmon of Narva are celebrated. Merchant vessels come up to the town; but the barks which come down the Narowa are unloaded about a mile above it at the island of Kragholm, where there is a fall of about 12 feet.

NARWHAL. [WHALES.]

NASA'LIS, M. Geoffroy's name for a remarkable genus of Monkeys established on the *Guenon-à-Long-Nez*, of Buffon, the Proboscis Monkey of Shaw, and the *Simia nasica* of Schreber.

The species known is the Kahau, or Proboscis Monkey (*Nasalis larvatus*, Geoff., *Semnopithecus nasalis* of Authors). This large monkey is remarkable for the uncouth development of the nose, forming a sort of proboscis capable of dilatation, with the nasal apertures beneath the bent-down apex, and divided from each other by a thin cartilage. Along the upper surface of this singular organ runs a longitudinal depression, indicating the division between the two canals. The ears are small; these, with the face and palms of the hands, are of a leaden colour with a tinge of yellow. Throat swollen, from the enormous laryngeal sac. Tail somewhat tufted at the top. In the adult male a full beard advances forward, and curls up under the chin, almost to the long nose. No cheek-pouches. In the young male, and probably in the female, the nasal proboscis is far shorter than in the adult male, and somewhat recurved. In this stage it is the *Nasalis recurvus* of Vigors and Horsfield, and has been regarded by most naturalists, ourselves included, as a distinct species; an error which the examination of many species in the Paris Museum has enabled us to correct.

Proboscis Monkey (*Nasalis larvatus*).

Habits, gregarious. Locality, Borneo; perhaps also Sumatra; and, according to Geoffroy, the Malay Peninsula.

For an account of the visceral anatomy of this species see 'Proceeds. Zool. Soc.,' 1837.

NASCENT STATE, a term proposed by Dr. Priestley to express the moment at which a gaseous body is liberated from previous combination and before it has assumed the gaseous form. The nascent state has a powerful effect in occasioning chemical combination, which could not occur without it.

NASH, THOMAS, was born in 1558, at Lowestoft, in Suffolk, and closed a calamitous life of authorship in his 43rd year. Dr. Beloe has given a list of his works, and Mr. D'Israeli an account of his privations and miseries. He has left only one dramatic performance entirely of his own composition, 'Summer's Last Will and Testament.' Nash was concerned with Marlow in writing 'Dido, Queen of Carthage,' 1594. Nash excelled in wit and satire, but was an indifferent dramatist.

NASH, JOHN, was born in 1752. Few particulars are known of his early life, or when he first began to apply himself to architecture as a profession. He was the author or promoter of the very extensive improvements in the metropolis, arising out of the formation of Regent Street and the Regent's Park. Buckingham Palace was built by him, and is a decided architectural failure. In the Pavilion at Brighton he succeeded no better. The United Service Club-house, the Haymarket Theatre, and the Terraces in St. James's Park, are among his other works. He died May 13, 1835.

NASIR-ED-DEEN, MOHAMMED BEN HUSSEIN AL THUSSI, a Persian and an astronomer, who died A.D. 1276, aged about 70. The astronomical tables made at the observatory of Maragha, in Azerbijan, under the superintendance of Nasir-ed-Deen, are called the Ilchanic Tables, from the name of his patron Hulaku, surnamed Ilkhan, the reigning prince. They enjoyed great reputation in the East, and are also known in Europe.

NASMITH, DAVID, was born in 1799, of respectable parents in Glasgow, where at an early age he took an active part in the formation of a Bible Society, of which he became secretary. This led to his appointment to act in a similar capacity to all the religious and benevolent societies in the city when they concentrated their offices in one general establishment. While holding this appointment, from which he derived only 60*l.* a year, he was very zealous in the formation of other societies, seventy of which he says he was the means of establishing between 1823 and 1826, in Great Britain, France, and America. After his resignation of his post he travelled all over the British Islands, France, the United States, and Canada, diffusing moral and religious instruction, and establishing missions and societies in every direction. Among the very numerous institutions in Great Britain which owe their existence to his exertions, may be mentioned the London and Glasgow City Missions, the British and Foreign Mis-

sion (now called the Town Missionary and Scripture Readers Society), the English Monthly Tract Society, the Adult School Society, &c. His zeal and perseverance were entirely disinterested, for he obtained very slender support during the many years he devoted to these objects. His exertions at length impaired his health, and he died at Guildford, in Surrey, Nov. 17, 1839.

NASMYTH, ALEXANDER, was born at Edinburgh, in 1758; he came early to London, where he was the pupil of Allan Ramsay, painter to George III. He studied afterwards several years in Rome, after which he settled in Edinburgh as a portrait painter, and Robert Burns was among his sitters. He died at Edinburgh in 1840. His landscapes are very numerous; Italy was one of his favourite subjects. His style is picturesque and simple.

NASMYTH, PETER, son of Alexander Nasmyth, was born in Edinburgh in the year 1786. He showed an early predilection for landscape painting. Early in life he injured his right hand, and learned to use the pencil and brush with his left. At the age of twenty he went to London, and his productions soon became very popular. He improved on the style of his father, and his pictures have less of the spotted chalky character, which, from its having been followed by other members of this clever family, is characteristic of what is called 'The Nasmyth School.' He died in lodgings in Lambeth, London, Aug. 17, 1831.

NASSAU ISLANDS, or *Poggy Islands*, are two islands which lie off the west coast of Sumatra, at a distance of about 60 miles. They lie between 2° 30′ and 3° 16′ S. lat., and are separated from each other by a strait, which is about two miles long and a quarter of a mile across. This strait forms an excellent harbour for ships of any size. It is surrounded by mountains, so that the water is quite smooth, and several fathoms deep.

NASSAU, THE DUCHY OF, has undergone numberless changes in consequence of partitions, re-unions, cessions, and acquisitions. It is at present composed of 23 different territories, including all those which formerly belonged to the several branches of the family. It is comprised between 49° 55′ and 50° 50′ N. lat., and 7° 31′ 50″ and 8° 45′ E. long., and is bounded by the Prussian-Rhenish provinces and by the different states of Hesse. The duchy is divided into three provinces, Wiesbaden, Weilburg, and Dillenburg, and subdivided into 28 bailliwicks. The country is generally mountainous or hilly, and there is no part that can be called plain. The mountains follow the Rhine and the Lahn in their whole course through the duchy, and form delightful valleys, which are among the most romantic parts of Germany; the most picturesque is the Rheingau from Biberich to Lorchausen, celebrated for its fine wines. Of the rivers the chief is the Rhine, which bounds the duchy on the south and west, and at Lahnstein receives the Lahn, which is navigable 14 leagues from its junction with the Rhine at Weilburg. The Main forms the boundary to the south-east. There are several smaller rivers and mountain streams, such as the Embs, Aar, Sieg, Wiedbach, Weilbach, and Niester. There are no canals and no lakes. On the other hand the country has numerous Spas and mineral springs, which are among the most celebrated in Germany; as Ems, Wiesbaden, Langenschwalbach, Nieder-Selters, Fachingen, and Geilenau. The natural productions are various and valuable. But the boast of Nassau is its wine, of which that produced about Hochheim is well known by the name of *hock*; there are likewise the wines of Marcobrunn, Asmannshausen, Rüdesheim, and Johannisberg. The breeding of cattle (especially horned cattle) is a chief source of wealth. The minerals are silver, lead, iron, copper, marble, freestone, limestone, slate, fuller's earth, and potter's, pipe, and porcelain clay. There are also some salt-springs. The forests, which abound in game, supply vast quantities of timber and fire-wood. The smelting and manufacturing of metals are carried on to a considerable extent; there are also paper-mills, tanneries, distilleries, tobacco, vinegar, and potash works, and some woollen, leather, and linen manufactures, but on a small scale. The trade is almost wholly limited to the exportation of the produce of the country. The population is 417,708, Catholic and Protestant in about equal numbers.

The Duke was formerly an absolute sovereign, but in 1817 a representative constitution was introduced. Otho, brother of king Conrad I., in the 10th century, is considered as the founder of the Nassau family, which after the death of Henry II. was divided into two branches, of which his sons, Wabram and Otho, were the heads. The dukes of Nassau are descended from the elder, and the house of Orange-Nassau (king of the Netherlands) from the younger branch.

The chief town, *Wiesbaden*, is situated in a small and pleasant valley on the southern declivity of Mount Taunus. In the immediate vicinity of the town there are productive gardens and orchards, and on every side neat farmhouses and villages. Wiesbaden is an open and constantly improving town, and has broad and well-paved streets. This place owes its prosperity and its name, 'Baden,' to the celebrated hot springs, which are sixteen in number. The visitors to these springs are very numerous. The chief buildings in Wiesbaden are—the palace, the town-hall, the Kur Saal, several splendid hotels, nearly thirty bathing houses, barracks, schools, a theatre, &c. The town has one Lutheran, one Calvinistic, and one Roman Catholic church. Population, 9000.

NASSAU, HOUSE OF, an ancient German family, which distinguished itself throughout Europe, during the 16th and 17th centuries, in the cause of civil and religious liberty. The counts of Nassau on the Rhine had, in the middle ages, acquired sufficient power to give a sovereign (Adolphus of Nassau, elected emperor A.D. 1292) and five ecclesiastical electors to the German Empire. Early in the 16th century the family of Nassau obtained the French principality of Orange in Provence, but the possession of large domains and hereditary dignities in the Netherlands had meanwhile numbered its head among the vassals whom the House of Austria gained

the marriage of Maximilian with Mary of Burgundy. The following are the most distinguished members of the family :—

William I., of Nassau, Prince of Orange, was the subject of the Emperor Charles V. He was born in 1533 at Dillenburg in Nassau, and was at first educated in the reformed religion; but the Emperor Charles V., seeing in him the germ of a great statesman, took him under his own care, and brought him up in the Catholic faith. On the abdication of Charles however William became a Calvinist. This step gave Philip II., who had always viewed William with jealousy and mistrust, an opportunity of gratifying his antipathy. The dissimulation of both however long prevented any open rupture, and it was not until 1568 that the detestable tyranny and inhuman cruelties of Alva against the Protestants in the Netherlands, compelled William to throw off the mask. From that time he stood forth as the champion of the great cause, which he is said to have embraced less from religious than political motives. Under every disadvantage William contended successfully against Alva, Don John of Austria, and Alessandro Farnese of Parma, until by his suggestion, and under his guidance as stadtholder, the seven Protestant provinces of Holland, Zealand, Utrecht, Friesland, Groningen, Overyssel, and Guelderland, concluded, in 1576, the famous Union of Utrecht, which formed the lasting basis of the Dutch republic. Philip felt so strongly the importance of this measure that he set a price upon the head of its author. This caused the death of William, who was shot by Balthazar Gerard, a Burgundian, at Delft, in 1584.

Maurice of Nassau, the second surviving son of William I., was born in 1567. He was elected stadtholder immediately after his father's assassination, and subsequently captain-general of the Seven United Provinces. At this epoch a great part of that territory was still in the hands of the Spaniards; but Maurice began vigorously to make head against them. In 1591 he displayed his skill and activity by the capture of Zutphen, Deventer, Nimeguen, and other important places. In 1593 he took Gertruydenberg, after a memorable siege, and Groningen in the following campaign. In 1597 Maurice, with the aid of the English auxiliaries under Sir Francis Vere, completely defeated the Spaniards at Turnhout in Brabant; and three years later, in 1600, he obtained at Nieuport, with the same confederates, a second and more brilliant victory over the archduke Albert of Austria.

Thenceforth, until the recognition by Spain of the independence of the Seven United Provinces in the truce for twelve years, which was concluded in 1609, Maurice continued to extend the successes of the States, and to raise the glory of their arms.

The cessation of hostilities exhibited the qualities of Maurice in a less favourable light. Placing himself at the head of the Calvinist party, he persecuted and banished the Arminians; and caused the pensionary Barneveldt, at the age of 72, to be executed on various false charges, of which the principal was, that he had 'troubled the state and religion.' [Barneveldt.] This act caused him to be greatly detested, and it was only the resumption of hostilities with Spain that turned the tide of public indignation. In this contest however he was not completely successful; and the reduction of Breda by Spinola is believed to have produced or hastened his death, which occurred April 23, 1625. He left no legitimate offspring, and was succeeded, both in the principality of Orange and stadtholdership of the United Provinces, by his half-brother, Frederic Henry.

William III., of Nassau, Prince of Orange, stadtholder of the United Provinces, and ultimately king of England, was born in 1650, and was the posthumous son of William II. of Orange, by Mary, daughter of Charles I. king of England. He was only in the twenty-second year of his age when he was called to the government of a factious and distracted state, a lawless populace, and a dispirited and disorganised army. With such means was he required to arrest the progress of the victorious king of France, who had invaded the republic, at the head of a veteran army of 100,000 men, aided by the best generals of the age. But William displayed a firmness and sagacity far beyond his youthful years, and in two short campaigns, the French armies, which had overrun the United Provinces, and penetrated almost to the gates of Amsterdam, were entirely driven out of the territory of the republic.

During the remainder of the war, which, after a separate peace between England and the States, was protracted with France for four years, William continued to give abundant proofs both of his political and military talents; and shortly before the close of hostilities, he had married Mary, eldest daughter of James, duke of York, and heiress presumptive to the British crown.

After his marriage William studiously abstained from taking part in the struggle of parties in England; and though, through his activity in thwarting the schemes of the French king, he had not been able to escape the displeasure of his uncle Charles II., he had lived on decent terms with his father-in-law. But when he publicly refused to support the repeal of the Test Act, James began to treat him as an enemy and to take injurious measures against the United Provinces. On the invitation of the principal persons both of the Whig and Tory parties, William was at length induced to undertake an expedition into England for the restoration of the national rights. He sailed from Holland with an army of about 14,000 men, and landed at Torbay, on November 5, 1688.

The throne having been declared vacant by the flight of James, the crown, with constitutional limitations to its power, was conferred jointly upon the Prince and Princess of Orange with remainder successively to the issue of the latter, to the Princess Anne and her children, and to the heirs of William by any other wife. In Scotland however the cause of James was upheld by the gallant Viscount Dundee, but perished with his fall in the brief moment of victory. In Ireland, the struggle maintained by James's Roman Catholic

adherents was more obstinate; but the battle of the Boyne in 1690, and the capitulation of Limerick in the following year, completed the submission of Ireland. Meanwhile William had the satisfaction, the greatest probably which his new dignity gave him, of engaging England in the League of Augsburg; although by the peace of Ryswick, which terminated the war in 1697, little more was gained from the French monarch by the allies than the recognition of William III. as king of England.

The possession of that throne had meanwhile given him little happiness. His whole reign was harassed with intrigues of faction and plans of insurrection at home; and his life and throne were assailed from abroad with base plots of assassination by the adherents of James II., and with projects of invasion undertaken by Louis XIV. After the death of the Queen in 1695, his measures experienced systematic oppposition from all parties. The first use therefore which was made in parliament of the peace of Ryswick was to compel him to reduce the army to an insignificant remnant of guards and garrisons, and to send out of the kingdom the regiments of French Protestant refugees, as well as his own Dutch guards.

In the midst of eager preparations for the renewal of hostilities with France, William's life was suddenly brought to a close. An accidental fall from his horse, by which he broke his collar-bone, gave a fatal shock to his worn-out frame; and he expired at Kensington Palace, March 8, 1702.

NASTU'RTIUM, an old word applied to some kind of pungent herb, such as cress. By the English of the present day it is given to the *Tropæolum majus*, an American annual with pungent fruit; by botanists, to the Watercress and plants allied to it; by the Romans it was applied to a plant resembling Mustard in its qualities.

NATAL, PORT, is situated on the eastern coast of Africa, in 29° 56′ S. lat., 31° 30′ E. long. The harbour is formed by a bay at the mouth of the river Natal, but the entrance is obstructed by a bar, and is not generally accessible to vessels drawing more than 9 feet of water. The port is frequented chiefly in order to purchase the teeth of the hippopotamus.

NATCHEZ. [Mississippi.]

NATIONAL ASSEMBLY. [Mirabeau.]

NATIONAL DEBT. The contracting of the English National Debt cannot be said to have been begun before the Revolution of 1688. Even for some few years after the accession of William and Mary the borrowings of the government were for short periods only. The first transaction of this kind of a permanent character arose out of the chartering of the Bank of England in 1693, when its capital of 1,200,000*l.* was lent to the public at 8 per cent. interest. A power of repayment was reserved by the crown, but there was no corresponding right of demanding payment on the part of the bank.

So cautious was the parliament in those days of burdening future generations for the exigencies of the present moment, that when the annual income was inadequate to meet the charges of the foreign wars in which the country was engaged, and it became necessary to borrow the deficiency, annuities were granted, not in perpetuity, but for lives and terms of years, the produce of certain duties being mortgaged for their discharge.

This cautious proceeding could not be long continued. The expensiveness of the wars in which the nation was engaged at the end of the 17th century made it necessary to incur debts beyond the means of their prompt redemption, and at the peace of Ryswick, in 1697, the debt amounted to 21½ millions. During the next ten years, although the country was again involved in a continental war, its amount was reduced to little more than 16 millions, and the greatest efforts were made to raise money without imposing any lasting burden on the people. These efforts indeed soon found their limit, and at the accession of George I. in 1714 the debt had accumulated to the amount of 54 millions, an amount which excited great uneasiness, and caused the House of Commons to declare itself under the necessity of making efforts for its reduction. In 1717 the debt amounted to 48½ millions, and the annual charge in respect of the same to 3,117,296*l.* A great part of this debt consisted of annuities granted for 99 years, the money obtained for which had varied from 15 to 16 years' purchase.

In 1736 the public debt of England amounted to about 50 millions, but the annual charge had been reduced below two millions. At the peace of Aix-la-Chapelle, in 1748, the national debt exceeded 78 millions, but in the following year the public obtained some relief from the burden through the lowering of the rate of interest. At the breaking out of the Seven Years' War, in 1756, the debt still amounted to 75 millions. A public writer of some repute, Mr. S. Hannay says, at that date, 'It has been a generally received notion among political arithmeticians that we may increase our debt to 100,000,000*l.* but they acknowledge that it must then cease by the debtor becoming bankrupt.'

When the Seven Years' War was ended by the peace of Paris, the debt reached 139 millions, and the annual charge was 4,600,000*l.* The war of the American Independence raised the debt from 129 to 268 millions, and the annual charge in respect of the same to 9,512,232*l.* At the beginning of the war of the French Revolution the debt amounted to 260,000,000*l.*, and its annual charge to 9,437,862*l.* But between 1793 and the peace of Amiens the addition made to the capital of the debt amounted to 360 millions, and the annual burthen was increased from 9,437,862*l.* to 19,945,624*l.* Between the recommencement of the war in 1803 and its termination after the battle of Waterloo in 1815, there were added 45 millions to the capital of the debt, which thus amounted, including the unfunded debt, to 861 millions, and the annual charge upon the public exceeded 32 millions of money. The national debt of Great Britain has been created solely by wars.

The amount of the national debt unredeem

on the 5th of January, 1816, was stated to be as follows in the fourth Report of the Select Committee of the House of Commons on Public Income and Expenditure :—

3 per cent. stock . .	£580,916,019
3½ „ . .	10,740,013
4 „ . .	75,725,504
5 „ . .	148,930,403
Perpetual annuities . .	816,311,939
Terminable annuities, 1,894,612*l.*, equal to an estimated capital of	30,080,347
Unfunded debt	38,794,038
Total of unredeemed debt .	£885,186,324
The annual charge upon which was—	
Interest upon perpetual annuities	£28,278,919
Terminable annuities . . .	1,894,612
Interest on unfunded debt . .	1,998,937
Charge for management paid Bank of England	284,673
Total annual charge . .	£32,457,141

Some little progress has been made since 1816 in the reduction of debt by the employment for that purpose of actual surplus revenue. An addition was on the other hand made to the debt by the grant of 20,000,000*l.* voted by parliament for compensation to the owners of slaves in the British colonies who were emancipated by the act of 1833. The unredeemed funded and unfunded debt which existed on the 5th January, 1845, and the annual charge thereon, were as follows :—

3 per cent annuities . . .	£519,303,960
3¼ „ . . .	248,701,379
3½ „ . . .	2,630,769
5 „ . . .	433,749
Perpetual annuities . .	771,069,858
Terminable annuities, 4,025,210*l.*, equal to an estimated capital of	67,509,670
Unfunded debt . . .	18,404,500
Total of unredeemed debt	£856,984,028
The annual charge upon which was—	
Interest on perpetual annuities .	£23,719,148
Terminable annuities . .	4,025,210
Interest on unfunded debt .	552,135
Charge for management . .	94,886
Total charge . . .	£28,391,379

The diminution of the annual burden in the course of twenty-three years, from 1816 to 1839, was 3,150,710*l.*, at which rate the total extinction of the debt would not be effected until the year 2053. The slow progress made in this direction stands in striking contrast to the rapidity with which the load was accumulated, the entire diminution effected during twenty-three years of peace being scarcely equal to the additions made during some of the single years of the war. In 1844 a portion of the National Debt which amounted to 248,701,379*l.* on which 3½ per cent. was paid, was converted into a 3¼ per cent. stock. This rate of interest is guaranteed until 1854, after which period 3 per cent. interest is guaranteed for twenty years. The immediate saving amounted to 625,000*l.* per annum. After 1854 the annual saving will amount to 1,250,000*l.*

It will be seen on comparing the above statements for 1815 and 1845, that the terminable annuities increased from 1,894,612*l.* to 4,025,210*l.* By the act 48 Geo. III. and several subsequent acts, the Commissioners for the Reduction of the National Debt were empowered to grant annuities, either for lives or for certain terms of years, the payment for such annuities being made in equivalent portions of permanent annuities, which were therefore to be given up and cancelled. By this course, which it will be seen has been acted upon to some extent since the peace, some future relief will be obtained at the expense of a present sacrifice. A part of the terminable annuities (1,294,179*l.*) will expire in 1860; in 1867 a further portion amounting to 585,740*l.* will also expire; and after that time portions will rapidly fall in. 'If,' says Lord Congleton ('Financial Reform,' p. 204) 'all the loans which have been raised since the beginning of the war of 1739 had been borrowed in annuities for ninety-nine years, their extinction would already have commenced.' An annuity for one hundred years is nearly the same in value as a perpetual annuity.

Some saving has been effected since 1816 in the charges of management. This saving was part of the bargain made by the government with the Bank of England on the renewal of its charter in 1833 and 1844, and may be considered as a part of the price paid by that establishment for the prolongation of certain of its privileges. The functions intrusted to the Bank of England with reference to the National Debt do not extend to the transaction of any matter connected with its reduction. Such business is placed under the control of a body of commissioners, who act *ex officio* under the provisions of an act of parliament. This board is composed of the speaker of the House of Commons, the chancellor of the exchequer, the master of the rolls, the lord chief baron of the Court of Exchequer, the accountant-general of the Court of Chancery, and the governor and the deputy-governor of the Bank of England. The greater part of these commissioners do not take any part in the management of the business, the details of which are attended to by permanent officers, viz. a secretary and comptroller-general, and an actuary, with an adequate establishment of assistants and clerks: the ultimate control is exercised by the chancellor of the exchequer for the time being, assisted by the governor and deputy-governor of the Bank of England.

The Unfunded Debt consists chiefly of Exchequer Bills, and their use is explained under the head UNFUNDED DEBT.

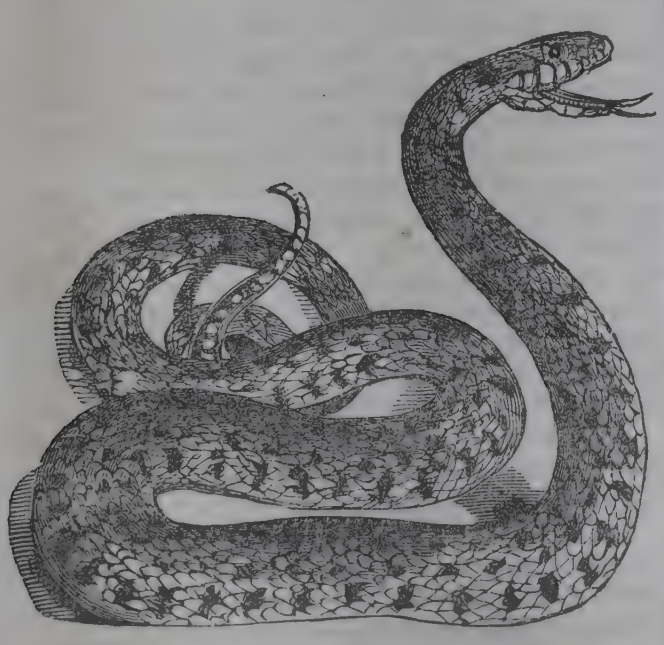
NATIONAL GALLERY. In 1823 Sir George Beaumont communicated his desire to present his collection of pictures to the Trustees of the British Museum. This led to the purchase of the Angerstein Gallery in the following year, by the government, for 57,000*l.* The original collection consisted of about forty pictures, chiefly of the Italian school, to which the addition of Sir George Beaumont's collection afterwards gave greater va-

riety. Since then the directors of the British Institution have at different times presented five pictures; and in addition, very valuable donations have been made by Mr. Richard Simmons, the Rev. Holwell Carr, Lieut.-Col. Olney, and other gentlemen. But the 'Vernon Gallery,' comprising 159 works of British artists, bequeathed by Mr. Robert Vernon in 1848, is the most extensive addition to the national collection that has been made at one time. There had previously been a great deficiency of the English school in the gallery, and many of the specimens there were by no means the best works of the artists. The Vernon Gallery however contains some of the finest works of our most celebrated painters, including, in addition to our principal living artists, specimens of Sir Joshua Reynolds, Sir Thomas Lawrence, Gainsborough, Wilkie, &c. Exclusive of the Vernon Gallery, the national collection comprises (1849) 217 works, thus making the total number 376.

NATRIX, Laurenti's name for a genus of *Colubridæ*, a family of snakes destitute of poison-fangs, and of which the Common Snake, *Natrix torquata* of Ray, may be taken as the example.

Generic Character.—Head distinct, oblong-ovate, depressed, covered with scuta; gape wide, body very long, nearly cylindrical, slender; scales imbricated, placed in longitudinal series, lanceolate, generally carinated; abdominal shields simple, arched at the margin; caudal shields biserial.

The Common or Ringed Snake is too well known to require description: the female is larger than the male. Its food consists of lizards, young birds, birds' eggs, mice, and more particularly frogs. The latter are generally captured by one of the hind legs, and in that case the prey is swallowed alive, and with the lower limbs and parts foremost, the head still continuing in its proper position, and disappearing last.



Common Snake (*Natrix torquata*).

Geographical Distribution.—The United Kingdom and Continental Europe.

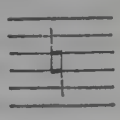
Reproduction and Habits.—Oviparous. Like all other serpents this snake changes from time to time its cuticular investment, or slough; and appears in brighter colouring, with the markings very vivid. After each change it becomes more animated and vigorous than previously, and ardently pursues its prey; it swims well and gracefully. It passes the winter in a state of torpidity; generally under some old dunghill, in the hole of a warm bank, or under the roots of a tree—reappearing in spring. This species is easily domesticated, and becomes very familar: it will drink milk. It is the *Coluber natrix* of Linn., the *Natrix torquata* of Ray. For an account of this harmless reptile, see Bell's 'British Reptiles;' White's 'Hist. of Selborne,' &c.

NATRON LAKES. These lakes are in a valley in the western desert which borders on Lower Egypt running between the calcareous ridge that skirts the western edge of the Delta and another parallel range which divides it from the *Bahr-bela-ma*. The Natron valley contains six shallow lakes, remarkable for the great quantity of salt which they produce. The crystallisations are both of muriate of soda, or common salt, and of carbonate of soda, called natron or trona. The lakes occupy a total length of about 16 miles; they vary in size according to the season; the bottom is muddy, of mixed sand and clay. The lakes are supplied by water which oozes out of the banks chiefly on the side which is towards the Nile. It appears that the water flows abundantly when the Nile is high, and decreases with its decrease, until some of the lakes become quite dry. The natron is collected once a year, and is used both in Egypt and Syria, as also in Europe, for manufacturing glass and soap, and for bleaching linen.

NATTER-JACK or *Natter-Jack Toad*, the English name for the *Bufo calamita* of Laurenti. This species of toad is spread over Europe, Western Asia, and Northern Africa. In England it is tolerably common in certain localities; it has been found on Blackheath, Putney Common, in the ditches near Deptford, in some of the heaths in Cambridgeshire, &c. In Scotland it is taken in a brackish marsh on the coasts of the Solway Firth near the village of Carse, and is abundant along the coast.

The Natter-Jack does not crawl like the common toad, nor leap like the frog, its motion being more like running. Its voice is deep. Colour variable, but a bright yellow line mostly runs down the middle of the back. See Bell's 'British Reptiles.'

NATURAL, a musical character, thus formed—



the use of which is, to make a sharpened note a semitone lower, and a flattened note a semitone higher; or, in other words, it brings into the scale of the natural key of C any note which has been made sharp or flat.

NATURAL ORDERS OF PLANTS. In classifying the vegetable kingdom according to the affinities of the species, it has been found necessary to collect together into groups such genera as have more resemblance to each other

than they have to anything else, and to these the name of Natural Orders has been given. They constitute the foundation of all arrangements, and are wholly independent of the peculiar views which different writers have taken of the manner in which the vegetable kingdom should be otherwise classified. Thus, while one author advocates the propriety of arranging Exogens by the modifications of their corolla, another by the insertion of their stamens, a third by what is supposed to be the progressive order of their development, and so on, the result of each of which methods is a different sequence of matter, the Natural Orders themselves remain unchanged. This being so, the study of their true limitation, and of the characters by which they are essentially distinguished, constitutes by far the most important branch of systematical botany, and accordingly we find that a large proportion of the natural orders yet founded are admitted without much difference of opinion.

For the natural orders now admitted in the writings of botanists the reader is referred to EXOGENS and ENDOGENS and to the numerous names of orders introduced in their places in the alphabetical arrangement of this work.

NATURALIZATION, from the Latin *Naturalis*, natural. 'If an alien be naturalized,' says Coke (Co. Lit., 129, *a*), 'he shall be to all intents as a natural subject, and shall inherit as if he had been born within the king's legiance.' This rule however is subject to some limitations.

Formerly there could be no naturalization except by act of parliament, but a new statute (7 & 8 Vict. c. 66) has facilitated naturalization, and made some other alterations in the law relating to aliens.

The number of foreigners naturalized previous to the passing of 7 & 8 Vict. c. 66. did not on an average exceed seven or eight a year, and the number who applied for letters of denization did not exceed twenty-five annually.

NAU'CLEA, a genus of plants belonging to the natural order *Rubiaceæ*. The species are trees, rarely shrubs, and they are natives of India and Africa. *N. Cadamba* flourishes about Calcutta and Malabar, where it grows to be a very large tree, and is ornamental and very useful from the extensive shade it affords. *N. parvifolia* is a native of the East Indies and all the coast of Coromandel, but chiefly in the mountains of the Philippines. The flowers are light yellow, and globular, about the size of a plum. The wood is of a pale chestnut colour, firm, and close-grained; it is useful for purposes where it can be kept dry, but when exposed to wet it soon decays. *N. cordifolia* is prized on account of its wood, which is light and durable where it can be kept dry. It answers well for furniture. There are thirty-seven species of this genus enumerated, all of which are natives of the East.

NAU'CRATES, a genus of fishes of the mackarel tribe having fusiform bodies, tails heeled at the side, and two free spines before the anal fin. The *Naucrates ductor* is popularly known as the Pilot Fish, and is remarkable for its habit of following vessels often for many hundred miles. Mr. Crouch, in the 14th volume of the 'Linnean Transactions,' has recorded an instance of two individuals of this species which accompanied a ship from the Mediterranean to Falmouth, where they were taken by a net. The *Naucrates ductor* is about a foot in length, and is remarkable for the beauty of its colour, being of a silvery pale blue banded by broad and deep transverse dark blue belts. (See Yarrell's *British Fishes*.)

NAUCY'DES, a Greek sculptor, who was born at Argos, and was in repute, according to Pliny, about Ol. 95; he was, says Thiersch, one of the most important artists between Alcamenes and Praxiteles. Pliny, Pausanias, and Tatian, describe ten of his works as of high excellence. The two statues of Chimon were, according to Pausanias (vi. 9), his best works.

NAUDÉ, GABRIEL, born at Paris in 1600, displayed at an early age a great aptitude for philological and critical studies. In 1624 he made his first journey into Italy, and on his return to Paris he published his work, 'Apologie pour les Grandes Personnages faussement accusés de Magie,' 1625. In 1631 he accompanied the papal nuncio Cardinal de' Bagni on his return to Rome, and was appointed his librarian. While at Rome he took a part in the controversy concerning the authorship of the book 'De Imitatione Christi,' in which he supported the claims of Thomas à Kempis. In 1642 Naudé was recalled to Paris, and appointed librarian to Cardinal Mazarin. On receiving an invitation from Queen Christina, to be her librarian, Naudé went to Stockholm in 1652. The climate did not agree with his health, and he set out to return to Paris, but died on his way, at Abbeville, in July 1653.

His principal works are—'Instruction à la France sur la Verité de l'Histoire des Frères de la Rose Croix,' 1623; 'Bibliographia Politica;' 'Avis pour dresser une Bibliothèque,' 1627; 'Additions à l'Histoire de Louis XI.,' 1630; 'De Studio Militari Syntagma.'

NAUMA'CHIA, the representation of a sea-fight among the Romans, which was sometimes performed in the Circus Maximus or amphitheatre, water being introduced sufficient to float ships, but more frequently in places made especially for the purpose, which were called Naumachiæ.

NAUMBURG. [MERSEBURG.]

NAUNTON, SIR ROBERT, was born in 1563. He studied at Trinity College, Cambridge. He attended his uncle, William Ashby, when he was sent as ambassador by Queen Elizabeth to Scotland in 1589. In 1596 he was sent by Essex to France, with letters to Antonio Perez, formerly Spanish secretary, probably with a view of securing the services of that statesman to the English government. But this and other diplomatic services do not seem to have been congenial to his open and candid disposition; and after the fall of Essex little is known of his career for some years. He was sworn Secretary of State, Jan. 8, 1618. Having opposed Buckingham's friend, Gondomar, the Spanish ambassador, he was deprived of office, but he was subsequently appointed Master of the Court of Wards. He died in 1635. His 'Fragmenta Regalia; Me-

moirs of Elizabeth, her Court, and Favourites,' was printed in 1641.

NAUPLIA. [NAPOLI DI ROMANIA.]

NAU'TILIDÆ, or NAUTILA'CEA, according to Lamarck, the sixth family of his *Polythalamous Cephalopoda*, consisting of the genera *Discorbites*, *Siderolites*, *Polystomella*, *Vorticialis*, *Nummulites*, and *Nautilus*. To these Mr. G. Sowerby, jun., adds *Simplegas* and *Endosiphonites*. In the system of M. de Blainville it is the fifth family of his *Polythalamacea*, and comprises the genera *Orbulites*, *Nautilus*, *Polystomella*, and *Lenticulina*.

NAU'TILUS, a genus of Cephalopods with polythalamous or many-chambered shells [CEPHALOPODA; CORNU AMMONIS], established by Linnæus, and adopted by succeeding zoologists. It is thus characterised by Lamarck. Shell discoid, spiral, multilocular, with simple walls. Whorls contiguous, the last enveloping the others. Chambers numerous, formed by tranverse partitions which are concave towards the side next to the aperture, their disc perforated by a tube, and their edges very simple.

Example.—The Pearly Nautilus (*N. Pompilius*). Locality, the warmer latitudes of the ocean.

It would appear that the Nautilus was not unknown to the ancients. Aristotle, after well describing the naked cephalopods (*μαλάκια*), says 'There are also two Polypi in shells, one is called by some *Nautilus*, by others *Nauticus*. It is like the Polypus, but its shell resembles a hollow comb or pecten, and is not attached. This Polypus ordinarily feeds near the sea-shore; sometimes it is thrown by the waves on the dry land; and, the shell falling from it, is caught and there dies.' 'The other is in a shell like a snail, and this does not go out of its shell, but remains in it like a snail, and sometimes stretches forth its cirrhi (*πλεκτάνας*) externally.' The first of these animals is evidently the Argonaut or Paper Nautilus, the latter the true Nautilus.

Among the older writers of modern times, who have described the Nautilus, we may notice Rumphius, 1705, who gives a figure and description of this animal, but the figure which is intended to represent the Polypus disengaged from the shell, is indefinite, and its details are erroneous. Denys de Montfort (in 'Hist. Nat. des Moll.,' Suite au Buffon de Sonnini, Paris, 1802) gives a pretended and most absurd figure of the Nautilus, which has been copied by Shaw, and others, but which is unworthy of notice. In fact, until very recently our knowledge of the Polypus of the Nautilus was very defective, and it is to Professor Owen that science is indebted for a masterly account of the structure of this animal, leaving nothing to be wished excepting that some fortunate collector may speedily capture a male specimen, and put it into his skilful hands.

The specimen (a female) submitted to Professor Owen's scrutiny was captured by G. Bennett, Esq., F.L.S., in Marakini Bay, on the south-west side of the Island of Errómanga, one of the New Hebrides group, Southern Pacific Ocean, on the 24th of August, 1829. It was floating on the water, when first observed, and in capturing it the shell was injured by the boat-hook, the animal at the instant beginning to sink for safety. This specimen is preserved in the Royal College of Surgeons.

It is impossible for us even to give a digest of Professor Owen's elaborate work, within a reasonable compass. The osseous system, the muscular system, the visceral apparatus, the circulating and respiratory system, the nervous system, and organs of sense, the conditions of sight, hearing, taste, and touch, the structure of the tentacular appendages, and the reproductive system, are each in their turn the subjects of elaborate scrutiny, admirable illustrations accompanying the minute details, and serving to render the latter easy of comprehension. All we can here do is to refer our readers to the work in question, entitled a 'Memoir on the Pearly Nautilus (*Nautilus Pompilius*, Linn.), with Illustrations of its External Form and Internal Structure,' published by direction of the Royal College of Surgeons.

Rumphius says of the Nautilus, 'When he floats on the water, he puts out his head and all his barbs (tentacles), and spreads them upon the water, with the poop (of the shell) above water; but at the bottom he creeps in the reverse position, with his boat above him, and with his head and barbs upon the ground, making a tolerably quick progress. He keeps himself chiefly upon the ground, creeping sometimes also into the nets of the fishermen; but after a storm, as the weather becomes calm, they are seen in troops floating on the water, being driven up by the agitation of the waves: whence one may infer that they congregate in troops at the bottom. The sailing however is not of long continuance; for, having taken in all their tentacles, they upset their boat, and so return to the bottom.'

Shell of Umbilicated Nautilus (*Nautilus scrobiculatus*).

Mr. Owen, who quotes this passage, observes that the extent to which the Pearly Nautilus is covered by its shell, and its close attachment to it, indicated the affinity to the Gasteropods in too strong a manner to escape the penetration of Aristotle, who, as we have seen, directly compares it in this respect to a snail; 'and the general resemblance,' says Mr. Owen in continuation, 'must have been sufficiently striking when, with his house above him and in the supine position, he

makes his way along the sand with a moderate degree of rapidity.'

Fossil Nautili.—The *Rhyncholites*, formerly considered to be the beaks of birds, are now, upon unquestionable evidence, proved to be the jaws of fossil Nautili and Ammonites. Blumenbach recognised these *Rynchol*ites as being rather the mandibles of Cephalopods, differing from all recent genera then discovered; and M. d'Orbigny, who found some large ones in the same beds with the shell of a *Nautilus gigas*, suspected that those Rhyncholites appertained to that species. The oolite (Stonefield), and the lias of Lyme Regis and Bath, will serve as examples of the British strata wherein these beak-stones occur. Fossil Nautili occur both in the tertiary and subjacent strata.

NAUVOO. [ILLINOIS.]

NAVA-EL-CANERO. [CASTILLA-LA-VIEJA.]

NAVAN. [MEATH.]

NAVARE'TE, JUAN HERNANDEZ, was born at Logroño in Castile. He is commonly known by the name of *El Mudo*, from having been rendered deaf and dumb by an illness in the third year of his age. He made great progress in the study of painting in Italy, and on his return to Madrid, in 1568, he was appointed painter to the king, for whom he painted his finest works, which are preserved in the Escurial. Among them are a small picture of the Baptism of our Saviour, the celebrated Presepio ('a stable'), in which the principal light proceeds from the infant, the 'St. Hippolytus, in search by night of the body of St. Lawrence,' and a Holy Family, generally considered as his masterpiece. He died in 1577, aged 53 years.

NAVARI'NO, called *Neocastro* by the Greeks, a small town and fortress of the Morea, built on the south coast of the bay of Navarino, about 5 miles N. of Modon, and about 3 from old Navarino, which is a ruined town with an old fort built on a steep hill on the northern coast of the bay, near the site of the Messenian Pylos. [MESSENIA.] The island of Sphacteria, or Sphagia, lies across the entrance of the bay, and adds to its security, rendering it one of the best harbours in the Levant. In modern times the bay of Navarino has become memorable for the naval battle which took place Oct. 20, 1827, between the French, English, and Russian combined fleets on one side, and the Turco-Egyptian fleet on the other. This battle, which ended in the complete defeat of the Ottomans, decided the independence of Greece.

NAVARRA (*Navarre*), a province of Spain, with the title of *Kingdom*, lying between 41° 58′ and 43° 17′ N. lat., 0° 43′ and 2° 27′ W. long., is bounded N. by France, E. by Aragon, S. by the province of Soria, and W. by Guipuzcoa and Alava. Its greatest length from N. to S. is 92 miles, from E. to W. 62 miles. Its area is 2440 square miles, and its population in 1833 was 230,925.

Three-fourths of the surface of Navarre are mountainous; the remaining fourth consists of a few large valleys and some small fertile plains. The Pyrenees, which form the northern boundary, send off numerous other chains, which gradually decrease in height as they approach the south. The loftiest summit of these mountains, Altobiscar, is about 5400 feet above the level of the sea. That part of the province which borders on France is very rugged, barren, and thinly peopled, excepting the valleys of Baztan, Santistevan de Lerin, and las Cinco Villas de Navarra. The southern part is much more level, more fertile, and more populous.

The principal rivers are the EBRO, and its tributaries from the left bank, the Ega, the Arga, and the Aragon, which last receives the Irati, the Salazar, and the Esca. Two small streams, the Alhama and the Queilas, drain a small portion of the province that lies on the right bank of the Ebro. The extreme north of the province is watered by the BIDASOA, a tributary of the Bay of Biscay. The climate of the northern districts is cold in winter, and rarely subject to excessive heat in summer; in the south it is far more genial and salubrious. The soil in the low grounds is very rich: there is also much fine pasture-land. The principal valleys are, BAZTAN; Roncesvalles, renowned in history for the defeat of Charlemagne in 778; and those of Lescou, Roncal, Baigorri [BAIGORRY], Salazar, and Aezcoa.

Navarre is almost isolated from the adjacent countries by the mountain barrier that surrounds it. In the northern frontier there are ten passes. On the sides of Biscay and Arragon the approaches are more difficult of access; and on the side of Castile the deep and rapid Ebro forms a barrier passable only by the three bridges of Logroño, Lodosa, and Tudela. The roads which traverse the province are excellent.

The mountains are mostly of transition and secondary rocks; jasper and marble are found. There are many mines of iron and one of copper; one also of rock-salt near Valtierra, and several hot springs.

Forests of pine cover the slopes of the Pyrenees, and much timber is cut, and sent down by the mountain streams to the Ebro, by which it is floated onward to Aragon and Cataluña. The other principal forest trees are the oak, the olive, the chestnut, the beech, and the box. Heaths, ferns, and broom, with many aromatic plants, grow on the mountains. The most important agricultural products of Navarra are wheat, maize, barley, oats, rye, spelt-wheat, chesnuts, beans, hemp, flax, olive-oil, and excellent wine, to the amount of about 10,500,000 gallons. A small quantity of cyder is also produced in the Baztan and Cinco Villas.

Navarra contains great numbers of horned cattle, sheep, goats, pigs, and mules. The annual produce of wool amounts to 1,412,000 lbs. The mountains abound in game and the rivers in fish. The wild animals are wolves, foxes, and wild boars.

The manufactures are coarse linen, some woollen cloth, leather, soap, iron, and brandy, of which the quantity annually distilled averages 2,000,000 gallons. There are also some potteries, a royal shot and shell foundry, and some manufactories of Spanish liquorice. The exports are corn, oil, wine, wool, and iron; the imports consist of cot-

tons and silks, cutlery, tobacco, sugar, spices, and other luxuries, which are imported, principally from France.

Navarra is divided into five districts, or *merindades*, named from the chief town in each, viz. Pamplona, Tudela, Sangüesa, Estella, and Olite. It has two bishoprics, those of Pamplona and Tudela.

The metropolis is *Pamplona*, situated on an eminence on the left bank of the river Arga, in the midst of a small, fertile, circular plain, called La Cuenca, inclosed by lofty mountains. It was anciently the court-residence of the kings of Navarra, and is still the residence of the viceroy of the province. It contains a cathedral, which is a neat Gothic edifice of great antiquity, 4 parish churches, a royal and an episcopal palace, a senate-house, a town-hall, a mint, a public granary, a university, a theatre, and a population of 15,000. The city is ill-built, but contains some handsome houses; the streets are narrow, but well paved, and clean. Bull-fights are occasionally held in the largest of the 6 squares of the town; an aqueduct supplies the city with water brought from the mountain of Subiza, 12 miles distant. Pamplona is well fortified; the citadel is a regular pentagon, of 1000 feet each side. The manufactures and commerce are unimportant.

Tudela, situated on the right bank of the Ebro, which is here crossed by a bridge of 7 arches and 1200 feet in length, has a cathedral, 2 hospitals, and a population of 8150. The streets are narrow and crooked, but clean; the houses are lofty, and all contain fountains. About 2 miles east of Tudela is the commencement of the unfinished canal de Aragon.

The other towns are—*Estella*, a town of 4600 inhabitants, on the Ega, 25 miles S.W. from Pamplona; *Olite*, 25 miles S. from Pamplona, with 5000 inhabitants, celebrated for its salubrious climate; *Corella*, on the Alhama, with 4000; *Tafalla*, north of Olite, with 2800; and Sangüesa, S.E. of Pamplona, on the Aragon, with 2500 inhabitants.

The political constitution and laws of Navarre are still the same which it enjoyed when an independent monarchy, and differ altogether from those of the rest of Spain. It is governed by a viceroy, who presides at the royal council, the supreme tribunal for civil and criminal causes. The legislative body is composed of the three estates of the kingdom: the clergy, the nobility, and the deputies, who are elected by the people. Castilian is the general language of the province, but the Basque is spoken in some districts.

NAVARRE, BASSE. [PYRE'NE'ES, BASSES.]

NAVIGATION. [LONGITUDE AND LATITUDE, METHODS OF FINDING; MERCATOR'S PROJECTION; SAILING.]

NAVIGATOR'S ISLANDS, a group of islands, situated in the Pacific, between 10° and 15° S. lat. and 169° and 173° E. long., consists of 9 islands, of which the largest, called Pola, or Savaii, is the most western. It is about 50 miles long and 30 miles wide, and the mountains rise to the height of 1000 feet. Eastward of Pola is Ojalava, which is hardly inferior in size. Moona is considerably less than Ojalava, and the other six are small. They all appear to be volcanic. The islands are clothed with trees loaded with fruit, and are very populous. They abound in pigs, dogs, fowls, birds, and fish, and the lower parts are covered with extensive plantations of guavas, bananas, and other fruits. The sugar-cane grows spontaneously on the banks of the rivers. The inhabitants belong to the Malay race.

NAVY, BRITISH. Alfred the Great was the founder of the English navy. A slight advantage gained by some ships of his over the Danes, in 876, induced him to build long ships and galleys, which, as his countrymen were not competent to manage them, he manned with such piratical foreigners as he could engage. After he had driven out the Danes, he applied his talents to improve his ships. Ethelred made a law that whoever was lord of 310 hydes of land should furnish one vessel for the service of the country.

William the Conqueror established the Cinque Ports, and gave them certain privileges on condition of their furnishing 52 ships for 15 days in case of emergency. King John claimed for England the sovereignty of the seas, and declared that all ships belonging to foreign nations which should refuse to strike to the British flag should be deemed fair and lawful prize. In 1293, an English sailor having been killed in a French port, war ensued, which it was agreed to settle by a naval action, which was fought in the middle of the Channel, and the English, being victorious, carried off above 250 sail. In 1340, when King Edward III. with 240 ships was on his voyage to Flanders, he fell in with and completely defeated, off Sluys, the French fleet of 400 sail, manned with 40,000 men. The same king blockaded Brest with 730 sail, containing 15,000 men. Many of the ships composing these fleets were Genoese and Venetian mercenaries, but they must have been very small, and the number of the ships and men is probably exaggerated. Henry VII. seems to have been the first king who thought of providing a naval force which might be at all times ready for the service of the state. He built the Great Harry, properly speaking the first ship of the royal navy; she cost 15,000*l*., and was accidentally burnt in 1553. Henry VIII. perfected the designs of his father. He constituted the Admiralty and Navy Office, established the Trinity House, and the dockyards of Deptford, Woolwich, and Portsmouth; appointed regular salaries for the admirals, captains, and sailors; and made the sea service a distinct profession.

The ships of this period were high, unwieldy and narrow; their guns were close to the water, and they had lofty poops and prows, like Chinese junks.

At the death of Henry VIII. the tonnage of the navy was 12,000 tons. Elizabeth increased the navy greatly. The fleet which met the Armada numbered 176 ships, manned by 14,996 men; but these were not all 'shippe royal.' Signals were first used in this reign. In 1603 the navy had 42 ships, the tonnage of

which amounted to 17,000 tons. Phineas Pett, the first able and scientific naval architect, introduced, in the reign of James I., a better system of building. Before the civil wars broke out, Charles I. built the Sovereign of the Seas, of 100 guns, and 1637 tons. In this reign the navy was first divided into rates and classes. Cromwell, who increased the navy considerably in strength, first laid before Parliament estimates for its support. The navy flourished under Charles II., but declined towards the end of his reign. In 1684, and during the following year, there were 179 vessels, measuring 103,558 tons. James II. took active measures for the restoration of the navy. He suspended the Navy Board, and appointed a New Commission, with which he joined Sir Anthony Deane, the best naval architect of his time, who essentially improved the ships of the line by copying from a French model. At the revolution the fleet consisted of 154 vessels, carrying 6930 guns and 42,000 men. In the second year of the reign of William III., in consequence of the war with Spain, an act was passed for building 30 ships to carry 60, 70, and 80 guns respectively. The dockyard of Hamoaze, out of which has grown the town of Devonport, was then established. Queen Anne, at her accession, found the navy to consist of 272 vessels, measuring 159,020 tons. At her death the number of vessels was 198, measuring 156,640 tons. In 1739, in consequence of hostilities against Spain, the navy was augmented; and on the breaking out of the war with France in 1744 there were 128 sail of the line. In 1747 a naval uniform was first established. The navy increased greatly during the war with France at this period, in which 35 sail of the line were taken or destroyed by the English. George III. at his accession found the navy to consist of

Ships of the line . .	127	321,104 tons.
Ships of 50 guns and under	198	

In the short war of 1762, 20 sail of the line were added to the navy, and at the end of the American revolutionary war it was composed as follows:—

Sail of the line .	174	about 500,000 tons.
Under	203	

The navy was kept in a high state of preparation, and when, on Feb. 1, 1793, the French republic declared war against England, this country was not unprepared. In a few weeks there were 54 sail of the line and 146 smaller vessels at sea. The following abstract will show the losses up to the peace of Amiens, exclusive of the casual losses:—

	Captured.	Destroyed.
British ships of the line . .	5	...
Smaller vessels	37	9
Total	42	9

Of the 443 vessels taken from the enemy during the war, 50 sail of the line and 94 under that size were added to the British navy.

During the peace of Amiens preparations for war were actively continued on both sides, and the declaration on the part of England was made in the month of May, 1803, at which time the navy was of the following force, as compared with 1793:—

	Ships of line.	Under.	Tons.
1793	153	411	402,555
1803	189	781	650,976

Notwithstanding the apparent increase, there were not so many line-of-battle ships fit for sea at the latter as at the former period by about ten. Of the 134 vessels taken from the enemy during that war, 33 sail of the line and 68 under were added to the British navy. Since that period, although it has seldom been called into active service, a powerful naval force has always been kept up by this country. Its extent may at any time be ascertained by reference to the 'Navy List' for the current year. An important part of the naval force now consists of steam-vessels, and in this branch continual accessions are being made. The 'Navy List' may again be referred to for the fullest and latest information.

Great improvements have taken place in the size and form of the British ships, as well as in the arrangement of the materials composing them, especially during the present century. As France and Spain enlarged their ships, the English were obliged to do the same; while from many of their ships added to the English navy we greatly improved our models. Sir Robert Seppings, late surveyor of the navy, and Sir W. Symonds, have introduced various improvements in ship-building, by which great reduction of space and money has been effected. In latter years Sir R. Seppings, Captains Hayes and Symonds, and Professor Inman, have been permitted to try their respective systems in experimental squadrons composed of vessels built under their direction, by which means some useful discoveries have been made. But, notwithstanding this, our ships, those at least built of oak—for we have not yet worn out a ship built of teak—do not seem to be so durable as in former times.

The government of the navy is vested in the Lord High Admiral, whose office has been in commission since the revolution, with the exception of two short periods, 1707–8 and 1827–8, when it was held respectively by Prince George of Denmark and William IV. when Duke of Clarence. At present the Board consists of a First Lord, who is a member of the Cabinet, and 5 junior lords. By their orders all ships are built, sold, or broken up; commissioned, employed, or paid off. All appointments or promotions are made or approved of by them; all honours, pensions, or gratuities, are granted on their recommendation. All orders for the payment of naval moneys are made by them; they prepare the naval estimates, and lay them before parliament. The civil departments of the Admiralty are directed by the surveyor of the navy, accountant-general, storekeeper general, comptroller of victualling, and physician-general.

The navy is composed of two bodies of men—seamen and marines. There are commissioned, warrant, and petty officers. The commissioned

officers are flag officers (admirals), captains, commanders, and lieutenants.

The crew of a ship consists of petty officers, able seamen, ordinary seamen, landsmen, boys, and marines. In time of peace the whole crew are entered voluntarily; during war men are liable to impressment, exemptions however being made in favour of particular classes. The best seamen are rated petty officers by the captain; they have an increase of pay, and are not amenable to corporal punishment while holding that rank. Every ship, according to her rate or class, bears a certain number of marines as part of her complement.

For the due maintenance of discipline, the captain or commander of every ship or vessel is authorised to inflict coporal punishment on any seaman, marine, or boy, by warrant under his hand. Courts-martial are ordered by the Admiralty and commanders-in-chief.

The idea of establishing an hospital for infirm and disabled seamen originated with Mary, wife of William III., and Sir Christopher Wren was employed to build an additional wing to Greenwich Palace for that purpose. The revenue of Greenwich Hospital is about 150,000*l.* a year. The establishment consists of a governor, a lieutenant-governor (both flag-officers), four captains, and eight lieutenants, residing in the Hospital. Persons discharged with disgrace, or by sentence of a court-martial, are not entitled to a pension.

There is a Naval College at Portsmouth, and two schools at Greenwich, called the Upper and Lower Schools, where the sons of naval officers or seamen are educated for the sea.

NAVY BAY, a natural harbour lying between the Atlantic coast of New Granada and the island of Manzanilla, about 6 miles from the town of Chagres. The island, which is a mile and a quarter long, one mile broad, and covered with luxuriant trees and shrubs, is separated from the mainland at its southern extremity by a channel of about 60 feet. A projecting reef stretching out from the mainland at the north-eastern extremity of the bay forms a natural breakwater. The harbour thus formed is accessible at all seasons; it is secure in every wind with a depth of 6 to 7 fathoms in the middle, and 3 to 4 within 60 feet of the shore, and capable of containing 300 sail. It has been lately proposed to have the Atlantic Terminus of the railway across the isthmus of Panama on the north-eastern side of Navy Bay, which is reached by steam-vessels in a little more than one day from New Orleans.

NAXOS, NAXIA, one of the larger Cyclades, lies E. of Paros, from which it is separated by a channel 6 miles wide. It is situated in the middle of the Archipelago. It is about half way between the coast of Greece and that of Asia Minor. Naxos is the most fertile of the Cyclades, and its wine is much esteemed; it produces corn, oil, cotton, silk, most kinds of fruit, and abounds with game. The plains and valleys are well supplied with springs. The chief town, called *Naxia*, is on the western coast of the island, and near it is the harbour, called *Porto Saline*, on account of the sea-salt which is collected there. The castle of Naxia, on the hill above the town, was built by the Venetians. There are about forty villages and many country-houses scattered about the island, the population of which is reckoned at 10,000. There is a Greek and a Latin bishop, with convents of both churches. The northern part of the island contains some mountains, from which came a kind of marble called by the Greeks Ophites on account of its being spotted like a serpent's skin, and which was much valued. Emery is also found there, and forms an article of export. [Archipelago, Grecian.]

NAZAIRE. [Loire-Inférieure.]

NAZARENES. Christians who continued to preserve the Mosaic law appear to have received the name of Nazarenes and Ebionites. The early fathers do not appear to have regarded the Nazarenes as heretics. This may be the reason why we find no mention of them till the fourth century, when they are named, for the first time, by Epiphanius.

NAZARETH. [Syria.]

NEAGH, LOUGH, a lake in the province of Ulster, in Ireland. Its form approaches to that of a parallelogram, having a length N. to S. of 18 miles, and a breadth E. to W. of about 11 or 12 miles. It is bounded N. and E. by Antrim, S.E. by Down, S. by Armagh, and W. by Tyrone. The area is estimated at 154 square miles; and the circumference, following the windings of the shore, at about 80 miles. The surface of the lake is 48 feet above the level of the sea at low water, and its greatest depth is about 102 feet. It is the largest lake in the British Islands.

Lough Neagh receives a number of streams, the principal of which are—the Blackwater, the Ballinderry, the Upper Bann, and the Main. The only outlet is the Lower Bann, which quits the lake at the north-western angle, and passing through Lough Beg, enters the sea below Coleraine.

Lough Neagh is navigated by small vessels, and communicates by one canal with Lisburn and Belfast, and by another with Newry.

NEAL, DANIEL, was born in London, Dec. 14, 1678. His early education was received at Merchant Taylors' School. After studying on the Continent, he became assistant to Dr. Singleton the pastor of an independent congregation in Aldersgate Street; and at the death of the latter in 1706, was chosen his successor. In 1720 he published a 'History of New England,' and subsequently edited a 'Narrative of the Method of Inoculating for Small-Pox,' practised in that state. But his chief work is the 'History of the Puritans.' It was originally published in 4 vols. 8vo, the first of which appeared in 1732, and the second, third, and fourth in 1733, 1736, and 1738 respectively. Neal died at Bath, in April 1743.

NEALCES, probably of Sicyon, a celebrated Greek painter, contemporary with Aratus of Sicyon, about 213 B.C. Pliny mentions a Venus by him, and a battle between the Egyptians and Persians on the Nile. Anaxandra, the daughter of Nealces, was likewise distinguished for her paintings; and his colour-grinder, Erigonus, be-

came a painter, and acquired great honour through the celebrity of his pupil Pausias.

NEANDER, CHRISTOPHER FREDERIC, was born at Ekau in Courland, December 26, 1724. Having completed his studies at the university of Halle, he first became tutor in a private family, and in 1750 was appointed pastor of a small congregation in a retired part of the country, whence he removed to Gränzhof, where he died July 21, 1802, regretted by all who knew him either as a man or as a writer. His fame rests chiefly upon his 'Geistliche Lieder,' a collection of devotional songs.

NEAPOLIS. [NAPLES.]

NEARCHUS, the son of Androtímus, was a Cretan by birth, but an inhabitant of Amphípolis on the Strymon. He accompanied Alexander in his invasion of Asia, and was appointed by him to conduct to the Persian Gulf the fleet which had been built on the Hydaspes. The narrative of this voyage, the earliest of which any account is given, was written by Nearchus himself; and though the original journal has been lost, Arrian appears to have given us, in his 'Indica,' everything of importance which it contained. Strabo and Pliny have also preserved some account of this voyage, but their narratives are full of mistakes and inconsistencies, and cannot be compared with the full and accurate account of Arrian.

Dodwell and some other modern critics have considered the journal of Nearchus, as preserved by Arrian, to be spurious; but its authenticity has been fully established by Gosselin ('Géographie des Grecs,' p. 25), Sainte Croix ('Examen Critique,' p. 250), and especially by Vincent ('Commerce and Navigation of the Ancients in the Indian Ocean,' vol. i., p. 68–77).

A very complete and interesting examination of the voyage of Nearchus is given by Vincent in the first volume of *The Commerce and Navigation of the Ancients in the Indian Ocean.*

NEATH. [GLAMORGANSHIRE.]

NEBULÆ. [STAR.]

NECESSITY, according to the common definition, is that by virtue of which a thing cannot but be, or whereby it cannot be otherwise. When, in a proposition which affirms any thing to be true, there is a fixed invariable connection between the subject and the predicate, then that thing is understood to be necessary. Necessity is opposed to chance, accident, contingency, and to whatever involves the idea of uncertainty and of possible variation. It is usually distinguished into logical, physical, and moral necessity. Logical necessity consists in the circumstance that the conception of something being different from what it is, implies a contradiction or absurdity. In this sense, it is necessary that two and two should be four, that converging lines, if produced far enough, should meet. Physical necessity has its origin in the established order and laws of the material universe. The necessity, in this case, is a necessity of consequence. Everything that takes place in the natural world happens by virtue of certain laws, known by experience to operate uniformly; and the results of their operation are hence, with reference to them, said to be necessary. When we ascribe anything to chance, we merely state our ignorance of the law or laws to which its existence is to be referred. Physical necessity is founded on the relation of cause and effect. By tracing back this connection, we arrive at the knowledge of a great first cause, that is, God, who is the only Being existing independently and by an absolute necessity. Moral necessity has reference to the volitions and actions of rational agents, and is intended to express the connection between these volitions and actions, and certain moral causes, as inclinations, desires, or motives generally. Whether there be any connection which, strictly speaking, may be termed necessary, between such motives, and the resolutions of the human will, and the consequent actions, or whether, independent of them, the will has a self-determining power, is an inquiry which has largely engaged the attention of both philosophers and theologians.

NECKAR-KREIS (circle of the Neckar), a province in the north-west of the kingdom of Würtemberg, is bounded N. and W. by the grand-duchy of Baden, E. by the circles of Jaxt and Danube, and S. by that of Schwarzwald. Its length from N. to S. is 55 miles; its breadth is about 36 miles; its area is 1278 square miles; and its population in 1846 was 495,414. The province is traversed by several ranges of moderately high forest-clad hills, which run in a western or north-western direction from the Rauhe Alb or Alps of Suabia, in the east of the kingdom. It takes its name from the river Neckar, which, rising on the Baden frontier in the south of the Schwarzwald, runs in a general north-eastern direction to the centre of the kingdom of Würtemberg, whence it flows northerly past Heilbronn, below which it turns to the N.W., crosses the territory of Baden till it reaches that of Hesse-Darmstadt, of which it forms the boundary to its entrance into the Rhine at Mannheim, after a course of about 170 miles. The Neckar receives in this province is the Enz, the Kocher, the Jaxt, and a great number of small streams. It is navigable for small craft from Cannstadt. There are several lakes and mineral springs in the province. The soil of the valley of the Neckar and of the other rivers is exceedingly rich and fertile. The chief products are wheat, hemp, wine, silk, and wool. Horned cattle, sheep, and horses of good breed are numerous. Railroads run from Stuttgardt to Heilbronn, and from Stuttgardt to Ulm; this last, which is not completed, will join the Bavarian lines; from the former a branch is in course of construction to join the great trunk line along the right bank of the Rhine, between Carlsruhe and Heidelberg. [WÜRTEMBERG.]

Towns. — STUTTGARDT. *Cannstadt*, a busy little town of 4010 inhabitants, on the Neckar, which here becomes navigable, is a station on the railway a few miles E. from Stuttgardt. It has a good trade in agricultural produce, a much frequented mineral spring, and manufactures of woollen cloth, tobacco, woollen yarn, and chemical products. ESSLINGEN. *Heilbronn*, 28 miles N. by railway from Stuttgardt, is situated on the

right bank of the Neckar, which is here crossed by a covered wooden bridge. It is surrounded with high walls and a deep ditch, and contains some good buildings, the most interesting of which are the church of St.-Kilian, the town-hall, and the house of the Teutonic Knights, now used as barracks. Heilbronn has a gymnasium, a public library, and about 10,000 inhabitants, who are actively engaged in trade, and in the manufacture of silver ware, carpets, tobacco, white lead, chemical products, gunshot, paper, &c. The navigation of the Neckar below this town is much facilitated by the Wilhelm's canal. *Ludwigsburg*, N. of Cannstadt, a mile from the left bank of the Neckar, is a well-built town, with 6208 inhabitants, exclusive of the garrison. The town, which, for its size, is one of the prettiest in Germany, has long wide streets, mostly lined with trees. The principal building is the former royal palace, one of the largest in Germany; it contains a great number of pictures of the old German and Flemish schools. The other remarkable objects are the military college, the lyceum, and the arsenal. Woollen cloth, linen, calico, jewellery, leather, nails, and cannon, are among its industrial products.

NECKER, JAMES, was born at Geneva in 1734. He was sent to Paris in his youth, and was employed in the house of Thelusson, the banker, who took him into partnership. In the course of twelve or thirteen years Necker realised a large fortune, and retired from business. He now began to aspire to official situations, and wrote several works on financial affairs, which made him favourably known. His 'Eloge de Colbert' obtained a prize from the French Academy. He afterwards wrote a memoir upon the French finances, with which the minister Maurepas was so delighted, that he obtained for the author the appointment of director of the treasury, in 1776. Necker was appointed director-general of finances, in June, 1777, when, being averse to imposing new taxes, he endeavoured to make up the deficiency in the income by economy and loans. In 1781 he published his 'Compte Rendu,' which disclosed for the first time the state of the revenue and expenditure of France. Being refused a seat at the council, on the score of his being a Protestant, he tendered his resignation in May, 1781. He withdrew to Switzerland, where he purchased an estate at Copet, on the banks of the Leman Lake, and here he wrote his work, 'Sur l'Administration des Finances,' 1784.

In 1787 Necker returned to Paris, where he wrote against Calonne, who had just been dismissed from his office of comptroller-general of the finances. In the following year (Aug. 1788), on the resignation of Brienne, Louis XVI. appointed Necker director-general of finances, as the only man capable of restoring order in the administration. His second ministry was short. Unable to check or direct the popular storm which arose on the assembling of the states-general, Necker left Paris and retired to Switzerland; but after the taking of the Bastille, the National Assembly demanded the recall of Necker, and Louis complied. Necker was received in triumph, but his popularity was short-lived. In December, 1790, he gave in his resignation to the National Assembly. He spent the remainder of his life in Switzerland, and wrote several political tracts. He had written, several years before, a work, 'De l'Importance des Opinions Religieuses.' He died in April, 1804. His daughter was the celebrated Madame de Staël.

NECRO'SIS is the term applied particularly to mortification or death of bone. Its general causes and the mode of reparation are the same as those of mortification generally.

NECTANDRA, a genus of plants belonging to the natural order *Lauraceæ*. *N. cymbanum* is a tree nearly 100 feet high, growing in the woods of the Orinoco, near S. Fernando de Atabasso, where it is called Sassafras, and also in the ancient forests of the Rio Negro in Brazil. The bark is aromatic, bitter, and stomachic. Martius suspects that it is one of the ingredients in the famous Woorary poison of Guiana. The bark of *N. cinnamomoides* has the smell and flavour of cinnamon, as which it is used in New Granada. *N. Puchury major* is said by Martius to bear the Pichurim Bean. In the early months of the year the fruits drop from their cups to the ground, and are collected by the natives, and then cleaned and dried by a gentle heat. They are prescribed in dysentery, diarrhœa, cardialgia, strangury, &c.

NECTARINE. [Amygdalus; Fruit; Peach.]

NECTARINIDÆ. [Sun-Birds.]

NECTARY, in Botany, a term used by Linnæus to designate those appendages of the corolla which secrete honey. The term has however, since the time of Linnæus, been used in a general sense to express any organ existing in the flower between the corolla and pistil, and which could not be rightly assigned to these or the stamens. Such parts or appendages of the flower have had many other names applied to them, and some much more commonly than nectary. A common form of appendage of the corolla is called *corona*. This organ is formed at the base of the limb of the corolla, and forms sometimes an undivided cup, as in the Narcissus, when it is called by Haller a *scyphus*. When it is separated into several parts, as in *Silene* and *Brodiæa*, it forms the *lamella* of some writers. In *Stapelia* this organ forms a thick solid mass, covering over the ovary and adhering to the stamens. It is here called the *orbiculus*. When this appendage is accompanied with little projecting processes, they are called *cornua*, or horns.

NECTU'RUS, M. Rafinesque's name for a genus of *Derotremata*, placed by Cuvier between the *Axolotls* [Axolotl] and the *Proteii* of Laurenti. This form is the *Menobranchus* of Harlan and the *Phanerobranchus* of Fitzinger.

Generic Character.—Four toes on each foot. A row of teeth on their intermaxillaries, and another, parallel but more extended, on their maxillaries.

Necturus lateralis (*Triton lateralis* of Say; *Menobranchus lateralis* of Harlan; and *Phanerobranchus* of Fitzinger) is the species best known, and will serve for an example of the genus. It is olive, with blackish spots above, and a blackish

stripe running from the muzzle just above the eye and reaching to the branchiæ, where it becomes continuous with the blackish belly, which is variegated with olive spots. The size is considerable; some say as much as two or three feet in length.

Geographical Distribution.—The great North American lakes.

NEEDLE MANUFACTURE. Soft steel wire of the required thickness is first cut into lengths of about five inches, and these lengths being placed together in a bundle, are bound together by means of iron rings, five inches in diameter, placed at each end of the bundle. This bundle is then placed on a cast-iron table, and rolled to and fro upon it, under the pressure of a flat bar of iron, by which means the wires are made perfectly straight. About a dozen and a half or two dozens of these wires are then taken by the grinder, and together are pointed on a small dry grindstone.

When the pointing is finished, the wires are cut into the required lengths, and the holes or eyes are perforated. This operation is usually performed by females. The tools employed are, a small anvil fixed on the work-bench, a hammer, a finely-pointed and well-tempered steel punch, a pair of plyers, a file, and a block of lead. The woman first slightly flattens the unpointed end by a stroke of the hammer, then makes an indentation on one side by means of the punch and hammer; the needle is then taken from off the anvil, and, being placed with the indented side downwards on the block of lead, the perforation is completed by striking with the punch and hammer on the opposite side of the needle. Holding then the needle in the plyers, the head is somewhat bent, and with the file the *guttering* is performed, which is the forming of the channel that may be seen on each side where the perforation is made. The head is then smoothed by passing the file over it. Needles to which the name drilled-eyed is applied are perforated in the manner here described, but the additional process is used of smoothing the eye by means of a drill after it is perforated.

For making the eyes and gutters in large needles, machinery is employed. The wires used for making these needles are pointed at both ends, and the channels and eyes are formed in the middle, when the two needles thus made are cut asunder, and their heads smoothed with a file.

These operations being performed when the steel wires are in a soft state, they are more or less bent, and must be straightened, which is done by rolling them on one plate of metal under the weight of another. The needles are then placed, many thousands together, in a kind of crucible, and covered over with ashes, when they are put into a close furnace and exposed to a cherry-red heat. When this degree of heat has been obtained, the crucible is withdrawn, and the needles are dropped into cold water, from which they are taken out and put upon an iron plate almost red hot, where they are turned about so as to cause the heat to apply equally to all, and as fast as the needles become of a blue colour, they are removed as being of a proper temper.

Such of the needles as now appear crooked are straightened on a small anvil by blows from a hammer.

The needles are next ranged in parallel rows upon a coarse cloth, which has been smeared with a mixture of oil, soft soap, and fine emery powder. In this cloth from 40,000 to 50,000 needles are rolled up, and several of these rolls are placed together in a machine like a mangle. The rolling to which they are here subjected is continued, by means of steam or water power, for two and sometimes three days, during which time the cloth wrappers, being worn out, require to be once or twice replaced by new ones. When taken out, after this rolling, the needles are perfectly bright. They are finally sorted, packed, and papered.

NEEFS, PETER, called 'the Elder,' born at Antwerp in the year 1570, was a disciple of the elder Henry Steenwyck, whose manner he closely imitated. He painted views of churches and convents, especially interiors, preferring those in the Gothic style of architecture. He possessed a profound knowledge of perspective. Being an indifferent designer of figures, those introduced in his pictures were often painted by F. Francks, Van Thulden, Velvet Breughel, or Teniers.

He died in 1651, at the age of 81. His son, Peter Martin (called 'the Young') painted in the same style, and chose the same subjects as his father, but was not equal to him.

NEER, ARNOLD VANDER, born at Amsterdam in 1619, is well known to connoisseurs and artists both by the peculiarity of his style, and by the handling and transparency of his landscapes. His subjects are chiefly views of villages with fishermen's huts on the low banks of rivers and canals. His reputation is founded on his moonlight scenes. He died in 1683, aged 64.

NEER, EGLON HENDRICK VANDER, son of the preceding, was born at Amsterdam, in 1643. In history, his composition is skilful and his drawing correct; his portraits, both large and small, are spirited and well coloured; and his conversation-pieces have all the excellencies of Terburg. He lived first at Paris, then at Orange, and lastly at the court of the elector palatine at Düsseldorf, where he died in 1703.

NE E'XEAT REGNO, the name of a writ which issues out of Chancery on the application of a party complainant, to prevent his debtor from leaving the realm of England. The writ is directed to the sheriff of the county in which the debtor is; and after reciting that 'it is represented to the king in his Chancery on the part of the complainant against the debtor, the defendant, that he the said defendant is greatly indebted to the said complainant, and designs quickly to go into parts beyond the seas (as by oath made on that behalf appears), which tends to the great prejudice and damage of the said complainant,' commands him to 'cause the said debtor to give sufficient bail or security, in the sum of . . . . *l.*, that he will not go, or attempt to go, into parts beyond the seas, without leave of the said court;' and in case the said debtor shall refuse to give such bail or security, the sheriff is to commit him to prison until he shall do it of his own accord, &c.

The question which always arises on application to the Court of Chancery for this writ is nothing more than this: whether the plaintiff has made out a case which is conformable to the terms of the writ, as interpreted by the decisions of the court.

The writ cannot be applied for unless a bill is already filed; but a plaintiff may apply for it in any stage of a suit, whether the writ is prayed for by the bill or not. The plaintiff cannot have the writ if he is out of the jurisdiction of the Court of Chancery. There must be a debt in equity actually due at the time when the writ is applied for. The application for the writ must be accompanied with an affidavit swearing positively to the debt, except the bill is for an account, in which case it is sufficient if the plaintiff swear that he believes there is a balance in his favour; or except where there is other decisive evidence of the debt.

This writ is founded on the real or supposed prerogative of the king to restrain his subjects from departing from the realm.

(*A Brief View of the Writ Ne Exeat Regno*, by Beames.)

NEGAPATAM. [HINDUSTAN. vii. 198.]

NEGROPONT. [EUBŒA.]

NEGUNDO, a genus of trees, separated from *Acer*. Two species are known, one of which is a handsome hardy tree, inhabiting the United States of North America, and now common in the gardens of this country; the other is a native of Mexico, and at present but little known.

NEHEMIAH. [EZRA.]

NEISSE. [OPPELN.]

NELEDINSKY-MELETZKY, YURII, the most eminent song-writer Russia has yet produced, was born in 1751. He served against the Turks, from the year 1770 to 1774, and after the peace accompanied the Russian mission to Constantinople. Subsequently an office in the civil department was bestowed upon him by the Emperor Paul, and in 1797–8 he accompanied that sovereign in his journey to Kazan and White Russia. The Emperor gave him an estate and the orders of St. Anne and St. Alexander Nevsky. His songs and ballads possess a gracefulness and charm of which the language afforded no previous models. He died in 1829.

NELLORE, a town of Hindustan, is situated on the south bank of the Pennair, in 14° 29′ N. lat., and 80° 3′ E. long. The town is surrounded by a mud wall, with some towers of stone at intervals. It is a populous place, and a considerable amount of business is carried on by the inhabitants: the principal street, which is three quarters of a mile long, is composed of well-furnished shops, but there are no handsome buildings in the town.

NELSON, ROBERT, born 1656, died 1714. He was educated at Trinity College, Cambridge, and while a young man was elected a Fellow of the Royal Society. He was intimate with Halley, with whom he travelled in France and Italy. At the Revolution he refused to take the oaths to King William, and remained a non-juror till 1709, when he returned to the Church of England as then established. The following are his principal works:—'Practice of True Devotion, in Relation to the End as well as to the Means of Religion;' 'Companion for the Festivals and Fasts of the Church of England;' 'Great Duty of frequenting the Christian Sacrifice;' 'An Account of the Life and Writings of William Kettlewell.' He also published the English works of Bishop Bull, who had been his tutor, with an account of his life and writings.

NELSON, HORATIO, son of Edmund Nelson, rector of Burnham Thorpe, was born at his father's residence in Norfolk, Sept. 29, 1758. Nelson had neither a strong frame nor a hardy constitution, yet he embraced willingly an opportunity of going to sea which was offered through his uncle Captain Suckling, who had been appointed to the Raisonnable, 64, in which Nelson was entered as midshipman. The Raisonnable was soon afterwards paid off, and Nelson served for a time in a West Indiaman, until the influence of his uncle procured him a rating on board the Carcass, Captain Lutwidge, in the North Polar expedition under Captain Phipps: on his return he was placed on board the Seahorse, and went to the East Indies in her, from whence he was invalided. Recovering his health on the passage home, he was appointed acting-lieutenant to the Worcester, and afterwards commander of the Badger brig, in 1778, and post-captain to the Hinchinbroke in 1779. He distinguished himself at the siege of Fort San Juan, Nicaragua, and took the island of St. Bartolomeo. Pestilence reduced his crew from 200 to 10 men, and Nelson, crippled by disease, was obliged to return home. When restored, he was appointed to the Albemarle, and afterwards to the Boreas, 28, in which he was sent to the Leeward Islands, in March, 1784. The Americans were then trading with the British colonies on the footing of British subjects, but as they had become foreigners by their separation from Great Britain, and as such were not allowed to trade with those islands, Nelson seized four of their vessels with freight at Nevis, carrying island colours. The whole colony rose against him, but the ships were ultimately condemned in the admiralty court. He married at Nevis, March 4, 1787, the widow of Dr. Nisbet, a physician, who had one son, named Josiah. He returned to England in June, 1787, and lived in retirement till the eve of the French revolutionary war, when, Jan. 30, 1793, he was appointed to the Agamemnon, of 64 guns. Nelson was sent with the despatches to the court of Naples, where he became acquainted with Sir William and Lady Hamilton. Subsequently Nelson was detached with a small squadron to co-operate with Paoli in Corsica. The French having withdrawn from St. Fiorenzo to Bastia, Lord Hood, with Nelson as his senior captain, attacked the fortress, which capitulated to Lord Hood, May 19, 1794. At the siege of Calvi Nelson lost an eye, from a shot striking the ground near him and driving the sand into it. The next service on which he was employed was the blockade of Genoa. He had a squadron of frigates under his orders, and narrowly escaped capture by the French fleet within sight of the English fleet, which was becalmed in St. Fiorenzo Bay. The

Austrians being beaten, the French retained possession of the Genoese coast, and Nelson sailed for Leghorn to refit. When Sir John Jervis took command of the Mediterranean fleet in 1795, Nelson resumed his station in the Gulf of Genoa. He next superintended the evacuation of Bastia, and having effected this, proceeded in the Minerva, Captain George Cockburn, to perform the same service at Porto Ferrajo. Thence Nelson took convoy to Gibraltar, fell in with the Spanish fleet at the mouth of the Straits, and joined Sir J. Jervis with the intelligence. He hoisted his broad pendant as commodore on board the Captain, 74 guns, Captain R. W. Millar, and was eminently distinguished in the general action of Feb. 14, 1797, with the Spanish fleet, in which the Captain, being at length crippled, fell alongside the San Nicolas, of 80 guns, and carried her by boarding. The San Josef, of 112 guns, was lying on the other side, and Nelson led the boarders from the San Nicolas to her, with the cry of 'Westminster Abbey or victory!'

Before the news of the action reached England, Nelson had been promoted to the rank of rear-admiral; the order of the Bath was now bestowed on him. He hoisted his flag in the Theseus, and commanded the in-shore squadron employed in the blockade of Cadiz. His next service was an unsuccessful attack on the town and fort of Santa Cruz, Teneriffe, in which he lost his right arm. He was rewarded with a pension of 1000*l.* a year. Early in 1798 Sir Horatio hoisted his flag in the Vanguard, 74, and joined Lord St. Vincent at Gibraltar, by whom he was detached May 9, to watch the port of Toulon, where the expedition for Egypt was then fitting out. The French fleet got out, Nelson pursued it, and after a long and arduous search, on finding it in Aboukir Bay, he attacked and defeated it. The action commenced at 6h. 20m. P.M., August 12, and by noon of the 13th, of the French fleet, 1 ship had blown up, 8 had surrendered, 2 escaped, and 2 were aground, of which 1 yielded, and the other was burnt by her crew. Nelson received a severe wound in his forehead from a piece of langridge-shot. On this occasion he was created Baron Nelson of the Nile, and pensions of 3000*l.* per annum were settled on him and his next two heirs male. From this time Nelson remained chiefly employed on the Neapolitan coasts, during which period he sanctioned that which must ever remain a blot on his character—the murder of Prince Carraccioli. On Lord Keith's return from England, Nelson came home, leaving Captain Trowbridge in command of the squadron blockading Malta, which island capitulated in September, 1800. Within three months after his return, he separated from Lady Nelson, in consequence of his infatuated attachment to Lady Hamilton. He sailed, March 12, 1801, as second in command to Sir Hyde Parker, to the Baltic, with a fleet of eighteen sail of the line, frigates, bombs, fire-ships, &c., amounting in all to 53 sail. Lord Nelson having offered his services in the attack on the Danish fleet lying at Copenhagen, it was accepted, and he led the squadron in the attack on the fleet and the batteries. The action commenced at nine in the morning of April 1, 1801, and lasted five hours, when a truce was agreed upon, and ultimately the fleet was delivered up.

After some trifling service in the British channel, Nelson lived in retirement in Surrey, till called on to assume the Mediterranean command. He hoisted his flag in the Victory, in 1803. His chief employment was watching the French in Toulon. On May 12, 1805, he sailed for the West Indies in pursuit of Villeneuve with ten ships of the line and three frigates, and arrived at Barbadoes June 4, on which day Admiral Villeneuve sailed from Martinique, and arrived off Cape Finisterre, July 9. Lord Nelson quitted Antigua, June 18, and made Cape St. Vincent, July 17. He then joined Admiral Cornwallis off Ushant, and leaving his fleet there, went home, and struck his flag. He hoisted it again in the Victory, September 15, 1805, and arrived off Cadiz on the 29th (his birth-day), to take command of the Mediterranean fleet. The force under him consisted of 27 sail of the line, and 4 frigates. On October 21, at day-break, the combined French and Spanish fleets, consisting of 33 sail of the line and 7 frigates, were seen. At 11h. 40m., while bearing down in two lines on the enemy, Lord Nelson hoisted the celebrated telegraphic signal, 'England expects every man to do his duty.' At 10 minutes past noon Collingwood, in the Royal Sovereign, commenced the action on the part of the British. In the heat of the action, about 1h. 25m., Lord Nelson received his death-wound by a musket-ball fired from the Redoubtable, which entered his left shoulder, and lodged in the spine. He expired in 3 hours and a half. The total British loss was 450 men killed, and 1250 wounded. Seventeen French and Spanish ships were captured, and 1 burnt. Admiral Dumanoir escaped to the southward with 4 sail, which were shortly after taken by Sir R. Strachan. Admiral Gravina, with the remaining 11 ships, got into Cadiz.

On Jan. 9, 1806, the body of Nelson was buried at St. Paul's. His brother William was created an earl, with a grant of 6000*l.* per annum; 10,000*l.* were voted to each of his sisters, and 100,000*l.* for the purchase of an estate.

NELUMBIA'CEÆ, a natural order of exogenous plants, by some writers associated with *Nymphæaceæ*, or Water Lilies, which they resemble in appearance and manner of life, inhabiting the fresh waters of the temperate parts of the world, and producing large polypetalous flowers with numerous stamens. But these orders differ in such important circumstances that they can hardly be regarded as plants of very close alliance, much less as members of the same order. The best known species is *Nelumbium speciosum*, a magnificent water-plant floating in the rivers and ditches of all the warmer parts of Asia, and also found in the Nile.

NELUMBIUM, a genus of plants belonging to the natural order *Nymphæaceæ*. *N. speciosum*, Pythagorean Bean, is native in slow running streams and tranquil waters, in the warmer parts of Asia. The flowers are very beautiful, smelling of anise, and generally of a rose colour, seldom

white. A variety of this species, *Tamara*, is native of Malabar. It is one of the plants supposed to be the Lotos of antiquity, formerly found in Egypt. It is spoken of as having been used as food by the Egyptians. Both roots and seeds are esculent, and are accounted cooling and strengthening, and of service in diarrhœa. The seeds are somewhat of the size and form of an acorn, and of a taste as delicate as that of almonds. *N. luteum* is native of North America, in lakes and ponds: it has been naturalized as far as Philadelphia. The flowers are yellow, and resemble a double tulip. The seeds are very agreeable to eat, and are much relished by the Indians and children.

NEMEAN GAMES, one of the four great national festivals of the Greeks, derived their name from Némea, a village in the north-eastern part of Árgolis. They were celebrated under the presidency of the Corinthians, Argives, and inhabitants of Cleónæ; but in later times they appear to have been entirely under the management of the Argives. They are said to have been celebrated every third year.

NEMESI'ANUS, MARCUS AURELIUS OLYMPIUS, a Latin poet, said to have been a native of Carthage, lived under the reigns of Carus and his sons Carinus and Numerianus. He wrote a poem on hunting, 'De Venatione,' which has come down to us unfinished. He also wrote four eclogues, which have considerable poetical merit, and have been repeatedly published with the eclogues of his contemporary Calpurnius. The writings of Nemesianus have been inserted in the collection 'Poetæ Rei Venaticæ,' with notes, by G. Kempher, Leyden, 1741.

NE'MESIS (Νέμεσις), a female Greek divinity, who appears to have been regarded as the personification of the righteous anger of the gods. She is represented as inflexibly severe to the proud and insolent. According to Hesiod, she was the daughter of Night. There was a temple sacred to her at Rhamnus, one of the demi of Attica, about sixty stadia distant from Marathon. In this temple there was a statue of the goddess, made from a block of Parian marble, which the Persians had brought thither to erect as a trophy of their expected victory at Marathon. A fragment, supposed by some to be the head of this statue, was found in the temple of Rhamnus, and was presented to the British Museum in 1820. (*Elgin and Phigaleian Marbles*, i., p. 120; ii., p. 123.)

NEME'SIUS, Bishop of Emesa in Syria, and one of the ablest of the ancient Christian philosophers. He is supposed to have lived during the reign of Theodosius the Great, towards the end of the fourth century. He has been accused of holding some of Origen's erroneous opinions, but has been defended by Bishop Fell ('Annot.,' p. 20, ed. Oxon., 1671). It is as a philosopher and physiologist that Nemesius is best known, and his work 'De Naturâ Hominis' is one of the most accurate treatises of antiquity. Some persons have even supposed that he was acquainted with the circulation of the blood; but in the opinion of Freind, Haller, and Sprengel, he has no right whatever to be considered as the author of this discovery. There is an English translation of his work by George Wither, London, 1636, 12mo.

NEMO'CERA, the first family of dipterous insects in the arrangement of Latreille, includes such species as have antennæ composed of many joints, an exserted head, a sheathed sucker, and either simple or toothed tarsal hooks. It includes the species of *Culex* and of *Tipula*, the names given by naturalists to the Mosquitoes and Crane-Flies. These Linnæan genera are now greatly subdivided.

NEMOURS. [Seine-et-Marne.]

NE'MOURS, DUKES OF, a title borne first by a branch of the Armagnac family, the last of whom, Louis d'Armagnac, duke of Nemours, held a command in the army of Louis XII., in Italy, and was killed at the battle of Cerignola in Apuleia, in April 1503. The title has since passed through several families, and is now borne by the second son of the ex-king of the French, Louis Philippe.

NE'NNIUS, or NINNIUS, a monk of Bangor, in Wales, who seems to have lived in the first part of the ninth century. He wrote a history of Britain, styled 'Eulogium Britanniæ,' which appears to have been sadly mutilated and interpolated by an ignorant transcriber, who signs himself 'Samuel,' and 'a disciple of Beularius Presbyter.' See end of chap. 64 of Nennii Banchoriensis 'Eulogium Britanniæ,' edited by C. Bertram, and published together with 'Gildas' and 'Richard, the Monk of Westminster,' 8vo., Copenhagen, 1757.

NEOMORPHA, a new genus of birds established by Mr. Gould on two species from New Zealand; but the specimens wanted the feet and the greater part of the wings. (*Proceeds. Zool. Soc.*, 1836.)

NEOPHYTES (from a Greek word which means 'newly planted') is the appellation given to the converts to Christianity who have just received baptism.

NEOTS, ST. [Huntingdonshire.]

NEO'TTIA, a genus of plants belonging to the natural order *Orchideæ*. *N. Nidus-Avis*, Bird's Nest Orchis, is the only British species of this genus. The whole plant is of a pale reddish brown; the root formed of many thick flesh fibres, from the extremities of which young plants are produced. The stem is about a foot high with sheathing brown scales. It has no leaves.

NEPA, a genus of hemipterous insects of the family *Hydrocorisæ*, the species of which are popularly known as Water-Scorpions. Their bodies terminate in two long setæ, by means of which they acquire a supply of air for respiration, when immersed in the water or mud.

NEPAUL, or NEPAL, a country in Asia situated almost entirely within the range of the Himalaya Mountains, between 26° and 31° N. lat., and 80° and 88° E. long. It extends in length from W. to E. 450 miles, and from N. to S., on an average, 100 miles. On the N. it borders on Tibet, on the W. on the English province of Kumaon, on the S. on the plains of the Ganges, and on the E. on Sikim and Bootan.

The high masses of the Himalaya range occupy the surface of Nepaul along its northern boundary, and a great portion of this lofty mountain region is always covered with snow. These enormous mountain masses are furrowed by a comparatively small number of very narrow valleys, which are cultivated in their lower parts, where they sink down to about 6000 feet, but the upper parts are only inhabited during four months of the year by herdsmen, who find pasture for their cattle and sheep on the lower slopes of the mountains. Besides cattle, there are yacks, wild sheep and dogs, and the Tibet musk-deer. The few forests contain, in addition to pine-trees and birch, two species of juniper, which grow to the height of large trees; the boards cut from them are sent to Tibet and China.

The steep descent of this high mountain region is occupied by a rugged country, traversed by ridges. The valleys which lie between these ridges are long, but generally not more than one or two miles wide: in a few places they expand into plains of moderate extent. Agriculture however is not limited to them; it extends on the declivities of the hills nearly to their summits, when they are not too steep. The principal object of cultivation is rice, to which grain nearly one-half of the cultivated lands are appropriated, as the unevenness of the ground allows irrigation generally. Besides rice, the inhabitants raise maize, cotton, several kinds of legumes, wheat, barley, sugar-cane, and two species of madder. The pastures are indifferent, and hence the number of cattle and buffaloes is small. This region also contains several metals in abundance, especially iron, lead, copper, and zinc; the first three are worked rather extensively. Gold is found in the sand of some rivers. The mountainous districts which are not cultivated are covered with large trees, many of which are yet unknown to botanists; but oak, fir, walnut, chestnut, prickly palms, birch, and others, are frequently found among them.

Nepaul contains a small portion of the Gangetic plain, which is contiguous to the hilly country. It is a portion of the Tarai, or swamp, but of a much better description than that which lies south of Bootan, and belongs to Bengal.

Rivers.—Most of the rivers which drain the mountain-region of the Himalaya do not originate on the highest portion of that range, but beyond it, on the table-land of Tibet. This is particularly the case with the two principal rivers which drain Nepaul, the Gunduc, and the Coosy.

Towns.—Nepaul contains several considerable towns, which owe their origin or prosperity to the circumstance of this country being the principal thoroughfare by which the table-land of Tibet and the plains of the Ganges exchange their productions or supply their wants. Other towns owe their origin to the fertility of the country which surrounds them. This is particularly the case with those which are found in the plain called Great Nepaul. This plain, which is surrounded by mountains rising from 3500 to 4000 feet above it, is only about 20 miles long and 16 miles wide, and yet it contains three large towns, Khatmandu, Lalita Patan, and Bhatgong, and several smaller towns. *Khatmandu*, the present capital of Nepaul, contains about 4000 houses. The great number of temples and steeples, built in the style of Tibet, gives to the city a considerable degree of magnificence. The palace of the Ghorcali princes is an extensive but irregular building. *Lalita Patan* is said to be still larger, and to contain 24,000 houses. *Bhatgong*, the third royal residence, is stated to contain 12,000 houses, and to exceed the other two in the magnificence and size of its buildings. It is the school of learning, and its temples contain large libraries in Sanscrit and other languages relating to the Bhuddhist literature.

Inhabitants.—Several tribes inhabit the alpine valleys of Nepaul. The best known are the Newars, or Newari, who inhabit the plain of Khatmandu. They have attached themselves to one of the sects of Bhuddhism, but have introduced the division of castes, and their priests do not depend on the lamas of Tibet. The Newars are mostly cultivators of the soil, and exercise many arts and trades. They make coarse cotton-cloth, and work very well in iron, copper, and brass, and are particularly ingenious in carpentry. This tribe, as well as some others, still speak their own language, which is quite different from those of their neighbours. The higher region of the Himalaya Mountains is occupied by the Bhot, the same nation which inhabits Tibet. The majority of the population south of the high mountain are either Hindoos, or a mixed race, the offspring of the Hindoos and native tribes. The trade with Tibet is mostly in the hands of the Bhot, who transport their goods on the backs of sheep or men over the mountain passes. They bring from Tibet to Nepaul sheep, musk, skins of the musk-deer, chowry-tails, quicksilver, borax, sal ammoniac, Chinese silk stuffs, paper, drugs, gold, and silver; and they carry back rice, wheat, oil, iron, copper, cotton-cloth, catechu, juniper-boards (which are used in fine cabinet-work), pepper, spices, indigo, tobacco, otter-skins, sugar, and some smaller articles.

Commerce.—Nepaul exports to British India elephants' teeth, timber, hides, ginger, turmeric, wax, honey, oranges, long pepper, ghee, bastard cinnamon, large cardamums, and some smaller articles. It imports from the British dominions in Bengal cottons and muslins, silks of various sorts, raw silk, gold and silver, laces, carpets, English cutlery, saffron, spices, sandal-wood, quicksilver, cotton, tin, zinc, lead, soap, camphor, tobacco, pepper, and coral.

History.—In former times this country seems to have been divided among a great number of princes, each of whom was an independent sovereign of a valley, district, or tribe. In the middle of the last century the chief of one of these tribes, the Ghorkas, began to extend his dominions by conquest, and he and his successors were so successful, that in less than half a century they subjected all the countries situated within the mountains between Bootan on the east to the river Sutlej on the west, and they carried more than once their arms to Teshoo Lumloo, in Tibet. In 1792 their depredations on that side were

stopped by the Chinese, who entered Nepaul with an army of 70,000 men, and, after several victories, advanced as far as Noyacote. After that time the Ghorkas turned their ambitious views to the plains of the Ganges, and came to a war with the British in 1814, which was terminated by a peace in 1816, when the Ghorkas ceded to the British all the countries situated between the Sutlej and the Kali rivers, and agreed to evacuate the territories of the Raja of Sikim. Since that time they have been quiet.

NEPENTHA'CEÆ are exogenous plants inhabiting the damper and warmer parts of Asia, and having, in the place of leaves, large hollow bodies, furnished with a lid, and containing water, secreted from a peculiar glandular apparatus with which they are lined. They are considered to be closely akin to *Aristolochiaceæ*, and with them have been referred by Dr. Lindley to a new class in the vegetable kingdom called *Homogens*.

NE'PETA, a genus of plants belonging to the natural order *Labiatæ*, and the tribe *Nepeteæ*. *N. Cataria*, Cat-Mint, is native throughout the whole of Europe and middle Asia, and is plentiful in Britain. The whole plant has a strong smell between mint and pennyroyal. Cats are said to be fond of it, and hence it derives its name; they roll themselves on it, and tear it to pieces apparently with much pleasure. *N. glechoma*, Ground Ivy, is native of Europe and the north of Asia, in hedges and ditches, in woods and waste places, and is plentiful in Britain. The leaves of the ground ivy were formerly thrown into the vat with ale to clarify it and give it a flavour. This was called Gill Ale, Ground Ivy being named Gill or Gell, and Creep-by-Ground in some places.

There are about seventy species of *Nepeta* known to botanists. Some of them have pretty blossoms, and may be cultivated in the garden.

NEPHELINE. *Sommite.* This mineral occurs in attached hexagonal prisms, which are hard, whitish, translucent, and have a conchoidal fracture. It consists of silica, alumina, and soda.

NEPHRITE. *Jade; Axe Stone.* Occurs in masses, which have a splintery fracture, a greenish colour, and slight translucency. Silica, 50; magnesia, 30; alumina, 10; oxide of chromium and water, 10.

NEPOS, CORNE'LIUS, a native of Hostilia (now Ostiglia) on the Po, was a Roman writer and a friend of Cicero, who speaks of Nepos in several of his Letters. Nepos however was most intimate with Pomponius Atticus, whom he survived a few years, and whose life he wrote.

The work styled 'Vitæ Imperatorum' is in the earliest editions attributed to Æmilius Probus, who lived in the fourth century; but Lambinus, in 1568, maintained the authorship of the 'Vitæ' to belong to Cornelius Nepos. Yet there are expressions in the 'Vitæ' which are inconsistent with the supposition of their being written in the Augustan age; and accordingly some critics have supposed that Probus abridged the original work of Nepos.

The 'Vitæ Imperatorum' are short biographies of twenty Greek commanders, and of two Carthaginians, Hamilcar Barcas and Hannibal. From a passage at the end of the last it appears that the author intended to write also the lives of the great Roman commanders, 'that their exploits might be compared with those of the Greek, in order to judge which were the greatest.' These lives of the Roman commanders, if ever written, have not come down to us, but it seems that some of them at least were written, and, it would appear, by Nepos, as Plutarch quotes the authority of Nepos for facts concerning the lives of Marcellus and Lucullus. The 'Vitæ Imperatorum,' besides numerous faults in language, which have been already alluded to, contain many erroneous statements of facts. The sentiments expressed by the author are generous and virtuous, though often puerile and trifling. The life of Pomponius Atticus is much better both for the matter and manner than any of the rest, and gives a lively description of his character. The 'Life of Atticus' may be the genuine work of Nepos. The editions of the 'Vitæ Imperatorum' are numerous.

NEPOS, FLA'VIUS JU'LIUS, was the nephew of the patrician Marcellinus. Leo, having given his niece in marriage to Nepos, named him emperor of the West, A.D. 473, after the death of Olybrius. But a certain Glycerius, supported by the barbarians, who were then the masters of Italy, was already proclaimed emperor at Ravenna. Nepos sailed from Constantinople in 474, and landing at Ostia, surprised Glycerius in Rome, made him prisoner, and, having stripped him of the imperial garments, caused him to be ordained bishop of Salona in Dalmatia, which was considered a kind of exile. In A.D. 475, Orestes, a native of Pannonia, revolted against Nepos, and marched upon Ravenna, when the emperor fled across the sea to Dalmatia; and Orestes had his own infant son Romulus proclaimed emperor of the West. Nepos applied in vain to Zeno, emperor of the East, to assist him in recovering Italy. In the year 480 he was murdered at Salona by two officers of his court, upon which Odoacer, who ruled over Italy, passed over into Dalmatia and conquered that province.

NEPTUNE. [SOLAR SYSTEM.]

NEPTU'NUS, or NEPTUMNUS, a Roman divinity, whose attributes are nearly the same as those of the Greek Poseidon (Ποσειδῶν). Poseidon was the son of Kronus and Rhea, and the brother of Jupiter and Juno. Poseidon was the god of the water in general, of the sea, the rivers and the fountains; but he was more particularly regarded as the god of the sea, which he acquired as his share in the division of the dominions of his father Kronus. His wife was Amphitrite, and their son Triton.

The etymology of the names Poseidon and Neptunus is doubtful. Poseidon is written in Doric Greek *Poteidan*. We may compare the form of the word Nept-unus or Nept-umnus, with Port-umnus, Vert-umnus, and the word al-umnus, but the meaning or origin of the root *Nept* or *Nep* seems uncertain. The Greek sculptors gave a certain degree of roughness to the statues of Neptune. His hair was usually somewhat in disorder, and the whole of his figure was represented as

exceedingly powerful and muscular. Hence the 'chest of Poseidon' ('Iliad,' v. 479) is the poetic expression for this characteristic of the deity, which is illustrated by the noble fragment from the pediment of the Parthenon in the British Museum. ('Elgin Marbles,' vol. ii. p. 26, in 'Library of Entertaining Knowledge.') His right hand held the trident; and he was usually surrounded by dolphins and other marine objects.

NERAC. [LOT-ET-GARONNE.]

NER'ATIUS PRISCUS, a Roman jurist who lived under Trajanus and Hadrianus. A case is mentioned ('Dig.' 37, tit. 12, s. 5) in which Trajanus acted on the advice of Neratius Priscus and T. Aristo. Pomponius ('Dig.' 1., tit. 2, s. 2. § 47) states that Neratius was elevated to the consulship, but the year of his consulship is not certain. Neratius succeeded Celsus the father, and was therefore of the school of Proculus. There are sixty-four excerpts from Neratius in the 'Digest.' Neratius is often cited by the subsequent jurists.

NERBUDDA. [HINDUSTAN.]

NEREIDS (Νηρηΐδες), nymphs of the sea, were the daughters of Nereus and Doris. The Nereids are said by most ancient writers to have been fifty in number. They were originally represented as beautiful nymphs [NYMPHS]; but they were afterwards described as beings with green hair, and with the lower part of their body like that of a fish.

NE'REIS, Cuvier's name for a genus of Dorsibranchiate Annelids, comprehending the genus *Lycoris* of Savigny. Tentacles equal in number are attached to the sides of the base of the head; a little more forward are two other biarticulated ones, and between them two simple ones: they have only one pair of jaws in their proboscis. The branchiæ only form small laminæ on which a net-work of vessels creeps: there are besides two tubercles to each of their feet, two bunches of filaments, a cirrhus above, and one below.

Lamarck states that the antennæ of the Nereids are in general short. The eyes, when distinct, he says, are four in number. The proboscis is large, open at its extremity, and often furnished with salient points or small tentacles. Lamarck divides them into six genera, viz. *Lycoris*, *Nephtys*, *Glycera*, *Hesoine*, *Phyllodon*, and *Syllis*, principally on the ground of the presence or absence of jaws and the modifications of the antennæ. To these he adds *Spio*.

Geographical Distribution.—The Nereids are widely spread, and some of the species are found in most seas. Some are found on our own coasts.

NERI, FILIPPO DE', born in 1515 of a noble Florentine family, took holy orders in Rome, where he early distinguished himself for his works of charity. He was the founder of 'Oratorios' or sacred musical entertainments, so called from the Italian name of the chapel where those performances took place; and the congregation or order which he instituted took the name of 'Fathers of the Oratory.' This institution was approved by the Pope, Gregory XIII., in 1575, and soon spread over France, Italy, and other countries. Neri, after resigning the generalship of his congregation to his disciple Baronius—afterwards Cardinal—died in 1595. Some of his letters, and his 'Ricordi,' or advice to youth, have been published.

NERI, POMPE'O, was born at Florence in 1707. After studying in the university of Pisa, he was made professor of law in that institution. He held several offices under Francis, Grand Duke of Tuscany, and the Empress Maria Theresa. The latter commissioned him to confer with the Sardinian minister for a concordat concerning the currency of both states; in consequence of which Neri wrote and published his 'Osservazioni sopra il Prezzo Legale delle Monete,' 1751. He died at Florence in 1776. Besides the work above mentioned, he wrote other treatises on political economy, on taxation, and on the municipal laws in Tuscany.

NERIS. [ALLIER.]

NERIUM, a genus of plants belonging to the natural order *Apocynaceæ*. *N. Oleander*, Common Oleander, is native of the Indies, in humid places, but has now become wild in the south of Europe, by the side of streams and the sea coast. The flowers are rather large and of a bright red colour. This species contains a great quantity of gallic acid.

NERO, CLAU'DIUS CÆSAR, the sixth of the Roman emperors, was born at Antium in Latium, in the latter end of A.D. 37, nine months after the death of Tiberius. He was the son of Domitius Ahenobarbus and Agrippina, the daughter of Germanicus, and was originally named Lucius Domitius. After the death of Domitius and of a second husband, Crispus Passienus, Agrippina married her uncle the Emperor Claudius, who gave his daughter Octavia in marriage to her son Lucius, and subsequently adopted him.

On the death of Claudius, A.D. 54, Nero succeeded to the sovereign power [AGRIPPINA]; but his mother Agrippina made an effort to obtain the chief management of affairs. Under the direction of Seneca, who had been Nero's master, and that of Burrhus, the first five years of Nero's reign were distinguished by justice and clemency. His mother was enraged to find that her power over him became weaker every day, and his neglect of his wife Octavia, and his criminal love of Acte, a woman of low birth, widened the breach between them. The murder of Britannicus [BRITANNICUS], whom Agrippina threatened to set on the imperial throne in place of her son, forms the commencement of that long catalogue of crimes which disgraced the reign of Nero.

Nero soon broke through all restraints, and his love for Poppæa, whom he had seduced from Otho, led him to the murder of his mother. Poppæa perceived that she could not hope to become Nero's wife while Agrippina was alive, and she prevailed on Nero to consent to his mother's death. Seneca did not hesitate to palliate or justify this abominable crime. (Tac. 'Ann.', xiv. 11.)

In the eighth year of his reign Nero lost his best counsellor, Burrhus, and Seneca withdrew from the palace, where his enormous wealth was calculated to excite the envy even of the emperor. About the same time Nero divorced Octavia and married

Poppæa, and soon after put to death Octavia on a false accusation of adultery and treason.

In the tenth year of his reign, A.D. 64, Rome was almost destroyed by fire. Though Nero did all he could to assist those who had suffered from this calamity, he did not escape the suspicion of having himself set fire to the city, but the charge appears exceedingly improbable. In order however to remove the suspicions of the people, Nero spread a report that the Christians were the authors of the fire, and numbers of them were seized and put to death with cruel tortures.

In the following year, A.D. 65, a conspiracy was formed for the purpose of placing Piso upon the throne, but it was discovered by Nero, and the principal conspirators were put to death. Among others who suffered on this occasion were Lucan and Seneca. In the same year Poppæa died, in consequence of a kick which she received from her husband, while she was in an advanced state of pregnancy.

During the latter part of his reign Nero was principally engaged in theatrical performances, and in contending for the prizes at the public games. He visited the chief cities of Greece, and received no less than 1800 crowns for his victories in the public Grecian games. Soon after his return to Italy, Vindex, who commanded the legions in Gaul, declared against his authority; and his example was followed by Galba, who commanded in Spain. The Prætorian cohorts espoused the cause of Galba, and the senate pronounced sentence of death against Nero, who prevailed upon one of his attendants to put him to death, after making an ineffectual attempt at suicide. (A.D. 68.)

Nero is an example of a youth who was corrupted by the possession of power; of one who under other circumstances might have been no worse than many other men. He had some taste for the arts; none for war or oratory, the two great fields in which a Roman excelled. During his reign, the empire enjoyed in general a profound state of peace. In the east the Parthians were defeated by Corbulo; and in the west the Britons, who had risen in arms under Boadicea, were again reduced to subjection by Suetonius Paulinus. [BOADICEA.]

Coin of Nero.

British Museum Actual Size. Copper.

NEROS. [SAROS.]

NERVA, MARCUS COCCEIUS, the thirteenth Roman emperor, was born at Narnia, in Umbria, in A.D. 27, according to Eutropius. His grandfather, Cocceius Nerva, who was consul, A.D. 22, and was a great favourite of the emperor Tiberius, was one of the most celebrated jurists of his age. Nerva was employed in offices of trust and honour during the reigns of Vespasian and Titus, but he incurred the suspicion of Domitian, and was banished by him to Tarentum.

On the assassination of Domitian on the 18th of September, A.D. 96, Nerva succeeded to the sovereign power. His mild and equitable administration formed a contrast with the sanguinary rule of his predecessor. But the Prætorian cohorts, who had been indulged by Domitian, were hostile to Nerva, and in order to strengthen himself, he adopted a man of ability and courage, Trajan, as his successor, and associated him in the government. Nerva died in the beginning of A.D. 98, after a reign of sixteen months and nine days. (Dion, lxviii. 4.)

NERVE, NERVOUS SYSTEM, and NERVOUS TISSUE. In a microscopic point of view nervous tissue may be separated into two elements, the *vesicular* and the *fibrous*. The vesicular nervous matter is gray or cineritous in colour and granular in its texture, containing nucleated nerve-vesicles, and being largely supplied with blood. The fibrous nervous matter is, on the other hand, usually white, and composed of tubular fibres, although in some parts it is gray, and consists of solid fibres; it is also less vascular than the preceding. The former is more immediately associated with the mind, and is the originating seat of the force manifested in nervous actions; while the latter is simply the propagator of impressions made on it. The union of these two kinds of matter constitutes a *nervous centre*, and the threads of fibrous matter which pass to or from it are called nerves. The smaller nervous centres are termed *ganglia;* the larger ones are the *brain* and *spinal cord*.

Two species of primitive fibre have been observed by microscopists in the fibrous matter; they have been named the *tubular* fibre, or the *nerve-tube*, and the *gelatinous* fibre; the latter is comparatively rare, and is seldom found except in the sympathetic system.

The *tubular fibre* is a tube composed externally of a fine transparent homogeneous membrane. Nucleated cells may however be occasionally seen in it. The contents of this tube consist of a soft, semi-fluid, whitish, pulpy substance, which is readily pressed out of its cut extremity. This is termed by Schwann the white substance, since the white colour of the nerve tubes is dependent on it. Within this, and occupying the centre of the tube is a transparent somewhat flattened band, which is extremely delicate, and in which it seems impossible to recognise any more definite structure.

In point of size the nerve-tubes present considerable variety even in the same trunk; and in the different classes of animals the differences are well marked.

In man and other mammalia they vary from the 1625th to the 6500th of an inch; in birds, from

the 2000th to the 3000th of an inch; in reptiles —in the frog—from the 1260th to the 2280th of an inch; in fish—in the eel—they are the 1043rd of an inch, and in the optic nerve of the cod-fish they are the 650th of an inch.

The chemical composition of nervous tissue has been variously stated. The following table has been drawn up by L'Heritier from his own researches.

	Youths.	Aged Persons.
Water	74.26	73.85
Albumen	10.20	8.65
Fat	5.30	4.32
Osmazome and salts .	8.59	12.18
Phosphorus	1.65	1.00

The nerves are arranged in two systems, the cerebro-spinal, or nerves of animal life, and the ganglionic, or great sympathetic system, or nerves of organic life. The nerves of the first system are all immediately connected with the brain and spinal cord, and include all those which are the media of sensation and voluntary motion; the second system contains those nerves which are connected with the brain and spinal cord, or the nerves proceeding from them, only by very small filaments, which bear numerous ganglia in all parts of their course, and which are subservient to the actions of those parts which are engaged in the nutritive functions, and upon which the mind has in general no direct influence.

These two systems of nerves are developed together from almost the lowest animals. Nervous filaments have not yet been seen in the bodies of the polygastrica, nor in the poriphera, nor in the polyp-bearing animals, though many of them are sensible to light and other impressions, and their motions indicate the agency of the same means as those which act in the higher animals. In those of the radiata in which distinct nerves are traceable, their distribution is circular, and hence the name of cyclo-neurose, often given to this class. A nervous circle is placed around the mouth, in a single or double cord, bearing minute ganglia, from which filaments radiate to the several divisions of the body, and especially to the tentacula and other moving or sensitive organs.

In the articulata, or diplo-neurose classes, the nervous system assumes the same lengthened form as the animals themselves possess.

In the mollusca, or cyclo-gangliata, the nervous œsophageal ring is present as in the last class, and is often provided with numerous distinct ganglia, whose size bears a direct proportion to the organs of sensation placed near the mouth, and to the activity and complexity of the masticatory apparatus. The columns continued along the abdominal portion of the animal are usually, like itself, short; and except when active motions are performed by a foot or other locomotive organ, they bear but few and very small ganglia.

The nervous system of the mollusca is thus chiefly concentrated about the head, and its development is proportioned to that of the organs of sense and motion which are subservient to nutrition, while the nerves of the body are but little developed. In the articulata, on the other hand, in accordance with the greater proportionate development of their locomotive powers, the part of the nervous system belonging to the trunk becomes predominant. In the vertebrata, or spini-cerebrata, which possess both nutritive and locomotive powers more highly developed than either of the preceding classes, the types of both are united; the cerebral mass being a more highly developed form of the large supra-œsophageal ganglion of the higher mollusca, while the spinal chord, with the ganglia on its sensitive roots, corresponds with the long ganglionic chords of the articulata.

The most essential part of the nervous system of the vertebrata is the spinal chord, with its continuation in the cranium as far as the crura cerebri and cerebelli, and the ganglia formed upon them, which together constitute that which is termed the cerebro-spinal axis. This axis is always inclosed in an osseous sheath placed in the posterior part of the body, and it is never, as in the invertebrata, traversed by the alimentary canal.

The sympathetic system of nerves distributed to the viscera, which in its simplest form, in the annelida, is composed of a few filaments from the supra-œsophageal ganglion, which pass along the dorsal artery, preserves in all the classes the same separation from the sensitive and motor cords, and the same general distribution about the viscera. It increases in complexity in the same degree as the cerebro-spinal system, and acquires in the vertebrata an extensive and still increasing development. It forms in the highest of them numerous and complicated plexuses, with many and some large ganglia, which follow the course of the principal blood-vessels, and are distributed to all the organs of organic life; it still communicates but little with the cerebro-spinal axis, sending only small filaments, which mingle with the spinal and some of the cerebral nerves near their roots.

The most important part of the nervous system of the vertebrata, and which is subject to most alteration, is the brain. [Brain.]

The functions of the cerebro-spinal nerves are, to convey impressions, made on the points in which they are distributed, to the brain, where they are perceived as sensations, or to the spinal cord, where they are perceived without sensation; and to convey the influence of the will from the brain, or some involuntary influence from it or the spinal cord, to the muscles by which some motion is to be performed. The influences that thus pass to and from the brain are conveyed through distinct nervous filaments, though the filaments subservient to each are generally inclosed in the same sheath, and appear to form a single and simple nerve. The filaments which convey impressions to the nervous centres are called sensitive or centripetal; while those conveying impressions from the centres to the muscles are named motor or centrifugal filaments.

The spinal cord, in which all the nerves of the trunk have their apparent origin, is composed of two lateral halves, symmetrical in form and size, and united together by a part of their inner surfaces at the median line. The outer portion

of the chord is composed of white nervous matter, the inner of gray, an arrangement the reverse of that of the brain, in which the cortical substance is gray, and the medullary or central white. Each lateral half of the spinal cord is again obscurely divided by superficial furrows into an anterior and a posterior column, and a smaller middle portion between them. All the nerves by which sensitive impressions pass, arise from the groove between the posterior column and middle column; and all those, with the exception of the spinal accessory nerve, by which the excitants to muscular motions are conveyed, arise from the groove between the anterior and middle columns. They all arise by what are called roots, that is, by a number of fine nervous threads or narrow bands attached to the grooves and passing for a short distance into the substance of the cord, which, as they proceed outwards, converge and unite into a single cord or nerve. There is an important distinction however between them; the roots of the posterior or sensitive nerves have a ganglion at their union just where they are leaving the vertebral canal, while those of the anterior or motor nerves unite without any ganglion into a single cord, which passes over, but does not communicate with the ganglion on the posterior roots. Beyond this ganglion the anterior and posterior roots unite in a common sheath, in which their filaments, though they continue distinct, are indiscriminately mixed; and in this manner they proceed through the varied branchings of the sheath to nearly all parts of the body, conveying the power of perceiving impressions to all, and the power of motion to the muscles and probably a few other tissues.

The conveyance of those impressions which produce common sensation is the property exclusively of those nervous filaments which arise from the posterior columns of the spinal chord and their continuations in the brain. If the posterior roots of a nerve be divided, all the parts supplied by that nerve lose their sensibility; or if a nerve be divided in any part of its course, then all the parts supplied by branches given off between the point of division and the brain retain their sensibility, while those which are supplied by branches given off in the other part of the nerve more distant from the brain are rendered insensible.

The laws deduced from these facts, and which are of great importance in the explanation of many diseases of the nervous system, are briefly these. The impressions producing sensation always pass from the circumference of the distribution of the nerves to the centre; they are always centripetal, and their centre, the seat of sensation, is the brain. They can pass only through the tissue of the nervous filaments to which they have been applied, and whose connection with the brain must therefore be unimpaired. The sensation is the same on whatever part of the nervous filament the impression is first made, and it is always referred to the peripheral end of the filament.

Many of the phenomena illustrative of the mode of conduction of the nervous influence in the sensitive nerves are repeated in the motor filaments, with this difference, that while in the sensitive nerves impressions always proceed from the circumference to the centre, or from the termination of the nervous filament in any tissue to its termination in the brain or spinal chord, in the motor nerves the impressions always pass in the opposite direction, that is, from the centre to the circumference, or from the brain or spinal chord to the muscle or other contractile tissue. When the motor filaments of a nerve are irritated in any part of its course, no pain is felt, but the muscles to which it is distributed contract; when a similar nerve is cut through (or otherwise prevented from conveying the nervous influence,) all the muscles to which the filaments that pass off from it, beyond the injured portion, are distributed, lose the power of being acted upon by the will, and very soon of being excited by any stimulus, while those from between the injured part and the brain retain their power. If the end of that portion of a divided motor nerve which is still connected with the nervous centre be irritated, no perceptible effect follows; if the end of the other portion, which is now separated from the brain, be irritated, the muscles to which its filaments proceed will for a time continue to contract. The same observations on the necessity of a continuity of nervous substance, on the absence of any communication between adjacent filaments, by which one might assume the office of another, and on the sameness of effect, whatever part of a nervous filament is irritated, may be made of the motor as of the sensitive filaments. As in by far the greater number of nerves, sensitive and motor filaments are contained within the same sheath, the phenomena, which have been described separately, will, in the case of injury or other affection of such nerves, be combined. Thus, when the nerve of any limb is irritated, sudden pain is felt and coincident convulsions ensue; when a similar nerve is divided, the limb becomes both senseless and motionless; if the upper part of the divided nerve (that still connected with the brain) be irritated, pain is felt, but no motion is excited; if the lower part be irritated, convulsions of the limb take place, but no pain is felt.

In all the phenomena hitherto considered, the mind takes a part; but in some circumstances an impression passes along a sensitive nerve to the nervous centre, and although no sensation may have been produced, an influence is in return conveyed back from the centre through a motor nerve, and motion is produced, either in the muscles adjacent to the part first impressed, or in those of some other part of the body. The phenomena of this class are those of what is called the *reflex function*; a term which is derived from the idea that the impression, passing centripetally, is *reflected* from the centre as soon as it arrives there, and made to pass from it centrifugally.

For the occurrence of these reflex actions, it is essential that the nerves acted upon should retain their connection with the spinal cord, or with the brain. The spinal cord is sufficient for some of these actions, and the power is therefore often spoken of as if it belonged exclusively to it; but it is evidently possessed by the whole cerebro-

spinal axis. Thus, if the hind-leg of a reptile or any other animal be separated from the body, and the skin of any part of it be irritated, no motion of its muscles will ensue; but if the leg be allowed to retain its connection with that part of the spinal cord from which its nerves come out, the same irritation of the skin will produce convulsive contractions of the muscles. In the first case the impression on the skin, if it passed along the sensitive nervous filaments at all, was lost at their cut extremity; in the second, it passed through them to the spinal cord, and thence, either it or some other influence, returned immediately through the motor nerves to the muscles.

On this property of reflecting the impressions received from sensitive to motor nerves, many of the muscular motions which were formerly regarded as instinctive or sympathetic, and many others of the most important phenomena, depend. Thus, when light falls on the retina, the impression received by the brain is instantly reflected through the third nerve, and the iris, without any effort of the will, contracts; and if the light be very strong and sudden, the eyelids involuntarily wince, as they do before any expected injury. In like manner a stimulus applied to the nose excites involuntary sneezing; food, or any other substance in the fauces or pharynx, excites the involuntary act of swallowing, and still more an irritation of the larynx is reflected from the medulla oblongata, and excites in all the respiratory muscles involuntary coughing. In all these cases sensation coexists with the reflection of the impression through the motor nerves; but sensation is by no means essential to the phenomena; on the contrary, in the most marked examples the centripetal impression is not perceived by the brain. Thus the sphincter muscles are constantly maintained in a state of contraction under the influence which passes unfelt from the spinal cord; and all the motions occurring in decapitated animals (in which the reflex actions are more remarkable than under any other circumstances) must probably be regarded as unaccompanied by sensation, since exactly similar phenomena occur in persons suffering from some forms of paralysis, and who can never feel the impression on the skin upon which the involuntary motions instantly follow. In the case of reflection from the optic nerve to the nerves of the iris, and in most of those in which the sensitive nerves pass directly to the brain, sensation is produced with the reflex action; but in all the cases where the centripetal nerves pass to the spinal cord, the reflex actions take place as well, or even more certainly, after the removal of the brain. The spinal cord is essential for a reflex action in the nerves that pass out from it; the brain for a similar action in its own nerves: in the first case sensation is not involved, in the second it generally is.

The system of the great sympathetic nerve is that whose branches are distributed to all the organs of organic life, the heart, lungs, digestive canal and glands, &c., chiefly following the course of the blood-vessels, bearing numerous and large ganglia in all parts of their course, and communicating with the brain and spinal cord or their nerves only by few and small filaments. The parts to which the branches of the sympathetic nerve are distributed have but vague if any sensibility, unless under peculiar circumstances of disease; and the motions which some of them possess are usually quite independent of the mind. Thus the peristaltic motion of the intestines, the contractions and dilatations of the heart of some animals, and some other similar actions, will continue for a considerable time after they are separated from the body, or after all the nerves passing to them have been divided. Many other facts prove also that the internal organs are much less dependent on the influence of the sympathetic nerve than the external animal organs are on that of their cerebro-spinal nerves: severe irritation of the sympathetic nerves, such as, if applied to the cerebro-spinal motor nerves, would excite sudden and violent convulsions of their muscles, gives rise to but weak and slow contractions of the viscera; and these follow at perceptible intervals after the application of the stimulus, so that it is often difficult to say whether the irritation have exerted any influence at all.

The office of the numerous ganglia placed in the course of the sympathetic nerves is perhaps the most obscure point in the whole range of physiology. Some have regarded them as so many brains, by which impressions are received through the branches of which each ganglion is the centre, and from which excitements to motion are sent out; others have believed that they exercise a power of isolating the organs they supply from the influence of the mind or of obstructing the constant passage of impressions to and from the brain; and many other functions have been supposed to be performed by them: but for each and all the evidence is altogether unsatisfactory.

The sympathetic nerve or system of nerves has received its name from the idea that it is of ultimate importance in the phenomena of what is called sympathy, in which one part of the body is affected in consequence of some peculiar condition of another. This doctrine is however nearly exploded at the present day.

NESS, LOUGH. [INVERNESS-SHIRE.]

NESTORIANS, the name of an important and early sect of Christians, which is derived from Nestorius, a Syrian by birth, patriarch of Constantinople in 428, under the reign of Theodosius II. A priest of Antioch, named Anastasius, preached that there were two persons in Jesus Christ, and that the Word, or divinity, had not become man, but had descended upon the man Jesus, born of the Virgin Mary, and that the two natures became morally united as it were, but not hypostatically joined into one person; and that when Jesus died it was the human person and not the divinity that suffered. This doctrine, being supported by Nestorius, was the origin of the Nestorian schism. Nestorius met with numerous opponents, among others Eusebius of Dorylæum; and the controversy occasioned great disturbances in Constantinople. Theodosius banished Nestorius to the deserts of Thebais in Egypt, where he died. His partisans however spread over the East, and have continued to form a separate church.

NETHERLANDS, KINGDOM OF THE, consists of the territory of the ancient republic of the Seven United Provinces and of some portions of the province of Limburg, and grand-duchy of Luxemburg. The kingdom of the Netherlands is situated between 50° 44′ and 53° 34′ N. lat., and 3° 30′ and 7° 10′ E. long. It is bounded E. by Germany, N. and W. by the German Ocean or North Sea, and S. by Belgium.

The kingdom of the Netherlands is divided into 12 provinces, of which the area and population, in 1847, were as follows :—

	Sq. Miles.	Population.
North Brabant . . .	1,942	403,698
Guelderland	2,000	373,383
North Holland . . .	930	468,006
South Holland . . .	1,170	566,257
Zealand	640	159,443
Utrecht	525	154,537
Friesland	1,027	247,467
Overyssel	1,240	212,538
Groningen	770	190,719
Drenthe	920	82,667
Limburg	848	202,942
Luxemburg	986	186,062
Total	12,998	3,247,719

Surface, Lakes, Rivers.—The Netherlands are part of the great plain of Northern Europe, and are not separated from Germany on the north-east by any natural boundaries. They form one unbroken flat without a hill or rock, without forests or running waters; they lie in part even below the level of the sea, against the inroads of which they are protected partly by immense dikes, and partly by sandhills or *dunes* from 80 to 180 feet high, which have been cast up by the ocean, and, running parallel with the coast, protect it against the element to which they owe their origin. From the Helder to the mouth of the Maas, a distance of 75 miles, these gloomy though protecting deserts everywhere extend between the cultivated country and the sea. The land thus rescued from the sea, consisting of moor and mud, is traversed by numberless canals, which are absolutely necessary to drain it and render it fit for cultivation. The eastern provinces nearest to Germany contain many meres and marshes, and especially the great series of turf moors which extend from the mouth of the Schelde eastward to the Maas, and there join the great morass called the Peel. This marshy country is one of the best cultivated, the most wealthy, and the most populous in Europe. The atmosphere in these low tracts is for the most part damp, thick, and heavy; the climate is unhealthy, especially for foreigners.

The whole coast, which is much broken and indented with considerable bays, large inlets of the sea, and the mouths of great rivers, would measure near 500 miles. The Zuyder Zee has been formed by the irruption of the ocean into a former Lake Flevo. It is 80 miles long from north to south, and its breadth varies from 20 to 30 and 40 miles. It is bordered sea-ward by the islands Texel, Vlieland, Schelling, and Ameland. The Lauwer Zee, the Dollart, and the Bies Bosch, have been formed by similar irruptions of the sea. The principal river is the Rhine. [RHINE.] The other principal rivers are—the Maas, Maese, or Meuse, which comes from Belgium, and joins the Waal at the fort of St. Andries; and the Schelde, which, likewise coming from Belgium, enters Holland below Antwerp, and divides into two arms, the East and the West Schelde; the West Schelde falls into the ocean at Flushing, and the East Schelde between the Zealand islands of Schouwen and North Beveland. Of the canals the most important is the North or Helder Canal. [HOLLAND, *North.*] The greatest lake is that of Haarlem. [HAARLEM.]

Natural Productions; Commerce; Manufactures.—The horses are a large strong breed, well adapted for draught and for heavy cavalry. The horned cattle are mostly remarkable for their size and beauty. There are about 700,000 sheep. The swine are of the German breed. The only kind of game are hares and rabbits. Domestic poultry is plentiful. There are wild geese and ducks, snipes, woodcocks, storks, and plovers.

Sufficient corn for home consumption is not raised; hemp and flax are grown in great abundance. There are no minerals, except a little bog-iron in Overyssel and Guelderland: there are brick-earth, potters' clay, fullers' earth, and a little sea-salt.

The history of the commerce of the Netherlands properly begins with Bruges in Flanders, in the 14th century. From Bruges the trade was for the most part transferred at the end of the 15th century to Antwerp, which became the greatest emporium in the world. But the ravages of the war with Spain and the capture of the city after the memorable siege in 1585 drove the wealthiest inhabitants to the northern provinces, especially to Amsterdam. The new republic of the 'Seven United Provinces,' founded on principles of civil and religious liberty, became a sure asylum for the oppressed, while religious dissensions and persecutions prevailed in many other parts of Europe. The Dutch East India Company conquered kingdoms and islands in the East; and Amsterdam became the first commercial city in the world. From 1795 to 1813 the trade of Holland was much depressed by French domination; but since that period it has partially recovered, though it has not attained its former extent.

The inland trade employs 5600 of the vessels called trekschuyts, and 15,000 boats.

The exports consist of colonial produce from the East and West Indies, coffee, sugar, spices, tea, silks, and other articles from China and Japan; and 2nd, chiefly of the productions of the country, among which are butter, cheese, flax, hemp, tobacco, madder, flowers, cattle, horses, and fish. The chief articles of importation are corn, salt, wine, timber, stone, marble, and various manufactured goods; besides colonial produce of every kind from the possessions in Asia, Africa, and the West Indies. The value of the British and Irish produce and manufactures exported t

Holland in 1846 was 3,576,469*l*. The produce imported into Great Britain from Holland is chiefly butter, cheese, flax, madder, and Dutch colonial produce.

The principal manufactures are linen of the best quality; woollens, once the most celebrated in the world; silks; and leather. Sugar refineries, tobacco-pipe manufactories, distilleries, and cotton mills, are numerous.

Religion; Education; Government; Colonies.—The established religion is Calvinism, or, as it is called, the Reformed Religion; but a general toleration has so long prevailed, that religious sects of almost every kind enjoy the free exercise of their own forms of worship.

Education is very generally diffused throughout the kingdom. Besides the parish schools, under the protection of the government, private boarding-schools are as numerous as in England. All schools are licensed. For the higher branches there are seminaries, called Royal Schools, where the ancient and modern languages, mathematics, rhetoric, and drawing are taught; of these there is one in every large town. The universities are those of Leyden, Utrecht, and Groningen.

The Constitution of the kingdom of the Netherlands is contained in the *Grond Wet*, or fundamental law of the kingdom of the Netherlands, promulgated by a royal ordinance of 24th August, 1815. This constitution resembles in many particulars that of Great Britain. The executive power is in the hands of the king, whose person is inviolable, his ministers being responsible. The legislative power is in the king and the states-general, consisting of two chambers: the members of the first chamber are appointed by the king for their life; the second chamber is elected by the provincial assemblies, and one-third of the members go out annually by rotation, but they may be re-elected. All new laws are proposed by the king to the second chamber. Each province has its own provincial assembly, which has various important local duties.

The Dutch still possess many important colonies: in Asia—Java, Amboyna, Banda, Ternate, Macassar, and settlements in Sumatra, Borneo, and Coromandel; in Africa, thirteen forts on the coast of Guinea; in the West Indies, the islands of Curaçao, St. Eustatius, and part of St. Martin, and, on the continent of South America, Surinam, and a right to send stores and receive produce from Demerara, Essequibo, and Berbice, formerly their colonies, but now in the possession of Great Britain.

History.—Julius Cæsar, in prosecuting his conquests in Northern Gaul, advanced as far as the Rhine. In the fifth century the Batavians, and in the sixth the Belgæ, were conquered by the Franks, but the Frieslanders not till the seventh century. At the peace of Verdun, in 843, Batavia and Friesland were incorporated with the newly created kingdom of Germany, and were under governors, who afterwards made themselves independent. Between the year 1000 and the end of the 11th century, the country was divided into duchies, counties, and imperial cities. Utrecht became a bishopric, and extended its temporal power over Groningen and Overyssel. Of all these princes the counts of Flanders were the most powerful, and their country having become subject, in 1383, to the still more powerful house of Burgundy, the latter made itself master of almost the whole of the Netherlands. The country passed into the hands of Austria, and then into the hands of Spain. During the reign of Charles V., the Protestant religion began to spread in these provinces. His son and successor, Philip II., introduced the Inquisition, and carried on religious persecution with a cruelty before unknown. The patience of the people was exhausted, and they rose in open rebellion, which the atrocities of the blood-thirsty Alba could not quell. In 1579 the five provinces of Holland, Zealand, Utrecht, Guelderland, and Friesland, concluded the celebrated Union of Utrecht, in which they declared themselves independent of Spain. They were joined in 1580 by Overyssel, and in 1581 by Groningen; and they thus formed the celebrated republic of the Seven United Provinces. Towards the end of the 17th century, they were engaged in war with France and England, and at the beginning of the 18th century, in the war of the Spanish succession. Holland was weakened by these efforts, while republican jealousy of the attempts of the House of Orange to increase its authority sowed the seeds of party rage and civil war. In 1747 the House of Orange triumphed, and William IV. obtained the hereditary dignity of stadtholder in all the Seven Provinces. In 1794 the republican or Anti-Orange party, encouraged by the approach of the victorious armies of France, again rose; and for twenty years Holland suffered alike from the hostility of the English and the control of the French. In 1813 the Prince of Orange returned, and governed the country by the title of 'Sovereign Prince,' till 1815, when the seven northern and the ten southern provinces, after a separation of 200 years, were again united, by the name of the Kingdom of the Netherlands. This kingdom lasted till 1830, when a revolt of the Belgians led again to a separation of the seventeen provinces into two kingdoms. [BELGIUM.]

Literature, &c.—It is not a little remarkable, that of a people whose shores lie opposite our own, and whose national character likewise runs in many respects parallel with ours, who have been animated by a similar spirit of industry, commercial enterprise, and maritime ardour—even the language should be hardly at all known in this country, notwithstanding the study of it is calculated to throw so much light upon our own, which has not only the same common origin, but has directly borrowed a great number of words and expressions from it.

Although they now stand in somewhat the same degree of relationship to each other as the English and Scotch, the Dutch and Flemish languages were originally the same. The difference between them has been occasioned by that of the northern provinces having been cultivated and refined and employed in literature, while the other has continued almost stationary in its primitive rudeness. Even in the 12th century the Dutch began to be

used in public decrees and civil acts; nor was it long before writers arose who began to mould it into rhythm, if not always into poetry. Jacob van Maerlant, Melis Stoke, Jan van Heln, Thomas van Ghessaert, Heijnric van Holland, were all writers of the 13th century. In the following one sprung up the literary societies known by the name of the 'Kamers der Rederijkers,' or 'Chambers of Rhetoric,' but which, so far from advancing poetry, rather corrupted the language itself.

Of the services of Erasmus both to letters and to religious liberty, or of the share which Holland took in the Reformation, it is not our purpose to speak; neither can we bestow any notice on those writers of the 16th century who obtained celebrity by works of erudition or science. The period we now arrive at may be considered as not merely the dawn but the morning of Dutch literature; and one of the first who contributed towards purifying and refining the native tongue was Dirk Volkertzoon Koornhert. Among other contemporary names of note appear those of Philip van Marnix, Peter Heijns, Spieghel, and Roemer-Visscher. The æra from the commencement of the 17th century to 1679, the time of Vondel's death, comprises some of the most illustrious names in the literary annals of Holland—those of Hooft, Cats, Decker, Kamphuysen, Anslo, and Antonides van der Goes. Next came Grotius, Heinsius and Barlæus, who wrote chiefly in Latin. Among those who wrote in Dutch were Huijgens, Jan Vos, and Anna and Maria Roemer-Visscher.

The greatest Dutch writer perhaps was Vondel, whose tragedies, odes, lyrical pieces, and satirical pieces, are all of a high order. Jan Antonisz, or Antonides van der Goes, who belongs not only to Vondel's time, but also to his school, having been his friend and pupil, was gifted with great power of imagination, and his 'Ijstroom' is considered one of the best descriptive poems in the language. Towards the close of the 17th century, French literature began to find imitators, and for a short time originality was checked. Elizabeth Koolaert was the best Dutch writer of this period.

The first half of the 18th century was marked by the productions of Van Effen and those of Poot, Hoogvliet, Schim, Feitama, De Marre, Steenwijk, and Langendijk. These writers cultivated a wide range of poetry and dramatic literature; and among those of lower distinction were Peter Boddaert, Frederick Duim, Dirk Smits, and Adrian van der Vliet. Peter Langendijk, originally a damask-weaver by trade, was one of the principal comic dramatic writers of this period; and that he possessed a natural genius for comedy can hardly be denied, when it is known that his 'Don Quixote,' which is still a stock-piece of the Dutch stage, was composed by him at the age of sixteen, though afterwards considerably improved. His 'Alexander the Great,' in which a countryman is served as Christopher Sly was, and made to believe, on waking, that he is the Macedonian hero, is highly comic, though defective from its want of interest in the plot.

In the latter half of the same century appeared William and Onno van Haren, two brothers, who produced many fine poems; of which the best is Onno's 'Geuzen' (first published in 1769, under the title of 'Het Vaderland'), which is not so much an epic as a cycle of national poems celebrating the leading events in the history of the Netherlands. Upon the whole, this production is the chef-d'œuvre of the Dutch literature in the 18th century. Lucretia Wilhelmina van Merken, or Madame van Winter, the most distinguished female poet of the century, acquired great reputation by her 'David' and her 'Germanicus.' Her husband, Nicolaas Simon van Winter was also a poet of considerable ability. Jan Nomsk, Lucas Trip, Voet, Bellamy, the Baroness de Lannoy, Kastelyn, Nieuwland, and Van Alphen, were among the distinguished poets of the same period. Bellamy was not only a genuine poet, but he gave a fresher and more energetic tone to Dutch literature, and was almost the very first who ventured to shake off rhyme. Bellamy's is perhaps the only poetry which the Germans have transplanted from the literature of Holland into their own. The two attached friends, Elizabeth Bekker (Wolff) and Agatha Deken, both of whom died on the same day, may be considered as the first who introduced the modern novel into Holland, their productions of which class were eminently successful, and some of them were translated into German. Petronilla Moens, Simon Stijl, Peter Leonard van de Kasteele, and Arende Fokke, are among the other names of the same century.

NET. [LACE.]

NETSCHER. *Caspar Netscher* was born in 1619, at Heidelberg, and ultimately settled at the Hague. He was one of the best painters of the Dutch school on a small scale. His most admired works are his conversation-pieces. He died in 1684.

Theodore Netscher, his eldest son, born in 1661, was his father's disciple. He went at an early age to Paris, where he remained twenty years. He painted a vast number of portraits of persons about the court, especially ladies. He came to England in 1715, where he remained six years, and acquired large sums of money by his paintings. He died at Hulst, near the Hague, in 1732.

Constantine Netscher, the second son of Caspar born in 1670, closely imitated the style of his father, and attained a high degree of excellence He died in 1722.

NETTLE, a name applied to various plants The true Nettles are various species of the genus *Urtica*, well known for their stinging properties which are owing to the presence of an acrid poisonous secretion, which in some Indian species is so dangerous as to cause excruciating pain and even death. Dead Nettles are species of *Lamium* monopetalous plants belonging to *Labiatæ*, and wholly inert. The Nettle-Trees belong to the genus *Celtis*, also destitute of stinging properties but having leaves resembling those of some kind of *Urtica*.

NEUBECK, VALERIUS WILHELM, born at Arnstadt in Thuringia, Jan. 21, 1765, studied at Göttingen and Jena, at which latter university he took his degree as doctor of medicine, and

practised first at Liegnitz, and afterwards at Steinau. His only professional production was his thesis 'De Natatione Frigidâ, magno Sanitatis Præsidio.' He acquired his literary reputation chiefly by his didactic poem entitled 'Die Gesundbrunnen' (or Mineral Springs), Breslau, 1795.

NEUBOURG. [EURE.]

NEUBURG, or NEUENBURG, is a well-built town in Bavaria, agreeably situated on an eminence above the Danube, and opposite to an island which is connected with the town by a bridge. Among the public buildings are a large handsome palace, a college, extensive barracks, the church of St.-Peter, an hospital, and an orphan asylum. Neuburg is the seat of a court of appeal, and of the courts of justice of the circle and the town. The inhabitants, who are 6000 in number, have considerable breweries and distilleries, a manufactory of earthenware, and a flourishing trade.

NEUFCHÂTEAU. [VOSGES.]

NEUFCHÂTEL. [SEINE-INFERIEURE.]

NEUFCHÂTEL (generally written *Neuchâtel*, but called *Neuenburg* by the Germans), a canton of Switzerland, situated in the Jura Mountains, which here form several parallel narrow ridges running in the direction of north-east to south-west, and separated by elevated longitudinal valleys. The greatest length of the canton is about 31 miles; the greatest breadth 13 miles. The area is 250 square miles. It is bounded on the west by France, on the south by the Canton de Vaud, on the east by the lake of Neufchâtel, and on the north by the canton of Bern. The canton is naturally divided into three regions: 1, the 'Vignobles,' being the banks of the lake, the level of which is 1400 feet above the sea, and the lower hills which rise immediately above, and are planted chiefly with vines; 2, the 'Vallon,' or the two fine valleys, Val de Travers and Val de Ruz, which run between two parallel ridges of the Jura, and rise from 2000 to 2400 feet above the sea; they produce corn, pulse, and fruits; 3, the 'Montagnes,' or highlands of the Jura, nearer to France, consisting of some naked and some wooded ridges, with high bleak valleys intervening, which are known by the names of La Chaux de Fond, Locle, Chaux du Milieu, La Brevine, and La Sagne.

The produce is chiefly cheese, wine, cattle, barley, and timber.

The population of the canton is about 60,000. Of this population about 10,000 are employed in agriculture, 7000 are watchmakers, and between 3000 and 4000 are employed in cotton and linen manufactories. The women, especially in the Val de Travers, are employed in the manufacture of lace. The religion of the people is chiefly the Protestant Calvinist. The language is French, which is spoken correctly by educated people, but the country-people speak various patois resembling those of their neighbours of Franche Comté and of the Canton de Vaud.

Neuchâtel, the capital, is built partly on the bank of the lake and partly on two hills divided by the river Seyon, which comes from the Val de Ruz. It contains about 6500 inhabitants. On one of the two hills is the castle, which was built in the 13th century, and near it the cathedral, which dates from the 10th century, and contains the tombs of the ancient counts of Neufchâtel. In the lower town are the hôtel-de-ville, the hospital for the burgesses, the orphan asylum, the hospital founded in 1810 by Pourtales the wealthy merchant, and a fine college, which contains a public library and a cabinet of natural history. The lower town, generally speaking, is well built, and has a fine appearance when seen from the lake. There is no other town of any importance in the canton, but there are many large villages.

Neufchâtel is a principality of which the King of Prussia, as representative of the house of Brandenburg, is the sovereign prince, but it has a representative assembly, consisting of 85 members, and a Constitutional Code.

The county of Neufchâtel was a fief of the old kingdom of Burgundy, and it had its line of counts until A.D. 1288, when it passed into the house of Châlons, from which it came into that of Longueville. In 1707 the ownership was obtained by Prussia. Bonaparte obliged the King of Prussia to surrender Neufchâtel in 1806, and he gave it to General Berthier, but in 1814 the county returned to the allegiance of the house of Brandenburg, and it was at the same time received as a canton into the Swiss confederation, of which it had already been for a long time an ally.

The *Lake of Neufchâtel*, called also the *Lake of Yverdun*, is 25 miles long by 5 broad. Its greatest depth towards the middle is about 400 feet. Its feeders are the rivers Orbe, Broie, Reuse, and Seyon. The outlet is the Thiele at the north-east extremity, which carries its waters into the neighbouring lake of Bienne, whence there is an outlet into the river Aar. The basin of the lake of Neufchâtel belongs to the water-system of the Rhine. The level of the lake is nearly 200 feet above that of the lake of Geneva.

NEUHAUS. [TABOR.]

NEUHOFF, THEODOR VON, known at one time as King Theodore, a German adventurer, was born towards the end of the 17th century, of the noble family of the counts of La Mark in Westphalia. His father was in the French service, and he himself obtained a lieutenant's commission in the regiment of Alsace. Cardinal Alberoni afterwards gave him the rank of colonel in the Spanish service. In Spain he married a lady of honour of the queen, whom he deserted, carrying off her jewels. He then travelled under different names and titles in Sweden, Holland, and Italy, and at last was put in prison for debt at Leghorn. On his liberation, meeting with several Corsican leaders, among the rest with the canon Orticoni, he proposed to undertake the cause of the Corsicans. The offer was accepted, and Neuhoff sailed for Tunis, where he succeeded in persuading the Bey to lend him arms and ammunition, promising him advantages in return. With these supplies he arrived, March 12, 1736, in the roads of Alesia, on the eastern coast of

Corsica. In the following April the general assembly of Corsicans elected Theodor for their king. He governed the country for some months, but having left his dominions to travel on the Continent, he was not permitted to return, though he made several attempts. After many vicissitudes, Theodor died in London, in December, 1756, and was buried in St. Ann's churchyard, Westminster, where the epitaph on his tombstone records the singular events of his life.

NEUILLY. [SEINE.]

NEUKIRCH, BENJAMIN, was born at Reinke, a village in Silesia, March 27, 1665. He was considered a reformer of poetry in his own day; but his poetical translation of Fénélon's 'Telemachus' is a bad one. His best productions are his satires and poetical epistles. He died at Anspach, Aug. 15, 1729.

NEURA'LGIA, a word of modern origin (derived from *νεῦρον*, a 'nerve,' and *ἄλγος*, 'pain'), first employed by Chaussier to designate a certain class of diseases of which the characteristic symptom is a most acute pain following the course of a nerve in one or more of its ramifications, subject to paroxysms and intermissions, in most cases unattended by either heat, redness, or swelling, and often without any apparent lesion at all.

The disease has been named according to the nerve which it attacks. Thus it has been called Frontal, Maxillary, Plantar, or other Neuralgia, according to the nerve affected. The Tic Douloureux is named *Neuralgia Faciei* by Dr. Good. Not only however are particular nerves affected, but whole masses of nerves or parts of the body may have this affection.

Sometimes the central mass of the nervous system is affected. Sometimes, instead of the branches of a nerve, the extreme filaments only are diseased, as would appear to be the case in many of those kinds of pain commonly called rheumatic. To these have been added torticollis, lumbago, angina pectoris, neuralgia of the arteries, gastralgia, enteralgia, hepatalgia, nephralgia, hysteralgia, neuralgia of the heart, testicle, bladder, urethra, diaphragm, &c. It may perhaps be rather fanciful to give the name Neuralgia to all these cases, and it would take up too much space to describe each separately; but they are all more or less characterised by the same peculiar sort of pain, coming on and leaving off suddenly, extremely acute while the paroxysm lasts, and subject to intervals of complete cessation.

Of the remote or predisposing causes of neuralgia very little is known. The immediate or exciting causes are very numerous, and sometimes extremely obscure. Among the most common may be mentioned, exposure to wet and cold, and mental excitement and agitation in persons of an irritable temperament. Local injuries of various kinds are another very frequent cause of the disease; such as the lodgement of any foreign body in the branch of a nerve, wounds, contusions, cicatrices, the too great distension of a nerve, carious teeth, &c.

The diagnosis of neuralgia is not in general very difficult, for even when it does not follow the course of a nerve, it may commonly be distinguished from every other disease by the peculiar character of the pain, its excessive violence during the paroxysm, and the absence of all symptoms of fever and inflammation.

The treatment of neuralgia varies according to the circumstances and condition of the patient. Sometimes tonics, as the preparations of iron, arsenic, and quinine, are most efficacious; at other times, narcotics, as the Indian hemp, opium, aconite, &c., exert the most influence over the disease. Wherever the disease is dependent on local causes, these must be removed, or no cure can be expected to follow any course of treatment. External applications are often beneficial as counter-irritants and caustics.

After all other remedies, both internal and external, have failed, the patient's last resource is the operation either of dividing the nerve or removing the limb; and even this will very often fail also.

NEURO'PTERA (from *νεῦρον*, a nerve, and *πτερόν*, a wing), one of the orders into which the class *Insecta* is divided. The insects composing this order may be distinguished by the following characters:—Wings, four in number, membranous, generally naked, and more or less transparent, but sometimes hairy; the mouth is usually fitted for mastication, or furnished with mandibles and maxillæ; the larvæ are provided with six legs and are active; their metamorphosis is variable, but is usually semi-complete. The character which gave rise to the name, viz. the minute reticulation of the nervures of the wing, will also in most instances serve to distinguish the insects of the present order from others. The May-Fly and Dragon-Fly afford familiar examples.

The order *Neuroptera* is divided by Latreille into three sections, to which he applies the names *Subulicornes*, *Planipennes*, and *Plicipennes*.

NEURUPPIN. [BRANDENBURG.]

NEUSATZ. [BACS.]

NEUSS. [DÜSSELDORF.]

NEUSTADT, a town in the archduchy of Austria, situated on the Vienna-Trieste Railway in 47° 50′ N. lat., 16° 15′ E. long., at a distance of 30 miles S. from Vienna, stands in an extensive plain on the navigable canal to Vienna, and at the junction of the Kehrbach and the little Fischa not far from the frontiers of Hungary. It contains, together with the suburb Leopoldstadt, 10,500 inhabitants, besides the military and the students of the academy. The town is pretty regularly built, nearly in the form of a parallelogram, with four gates; it is surrounded by a turreted wall and by a broad and deep moat. It is divided into four quarters, and has in the centre a large and handsome square, surrounded with arcades. The principal building is the ancient archducal palace, built in 1186, and assigned in 1762 by the Empress Maria Theresa to the imperial military academy, which has 36 professors and 500 students, a good library, a collection of philosophical instruments, a school for drawing, a bath, and a walled garden, 1400 yards long and 1200 broad. The old cathedral is a large stone edifice of the 13th century. Of the other

buildings, the chief are—a Cistercian abbey, which has a library of 20,000 volumes and a beautiful collection of minerals and shells; 2 hospitals; and a gymnasium. There are manufactories of velvet, silk, cotton yarn, earthenware, and paper. Neustadt carries on a brisk trade with Vienna, and with all the provinces of the Austrian empire.

NEUSTADTL. [Illyria.]

NEUTER. [Gender.]

NEUTRAL SALTS. Formerly this term included such salts as did not obviously contain an excess either of acid or alkali; but at present the term Neutral Salt includes such compounds as are composed of one equivalent of each of their constituents: thus the subcarbonates of potash and of soda are now termed carbonates, notwithstanding their alkaline reaction, because they consist of one equivalent of acid and one of base.

NEUTRALIZATION is a term generally applied to the decomposition of the alkaline carbonates, by the gradual addition of some acid more powerful than the carbonic, and which of course expels it from the alkaline bases with effervescence.

NEUTRIA. [Coypou.]

NEUWIED, a town in the Prussian Rhein-Provinz and government of Coblenz, situated in 50° 25′ N. lat., 7° 30′ E. long., on the left bank of the Rhine, is a well-built town, with broad straight streets, and contains 5708 inhabitants. The chief manufactures are silk, cotton, broad cloth, lace, thread, hats, carpets, leather, tobacco, stockings, and tape.

NEVA. [Petersburg.]

NEVADA, SIERRA. [Andalucia; Grenada.]

NEVERS (the *Noviodunum Æduorum* of Julius Cæsar), the capital of the French department of Nièvre, stands on the right bank of the Loire, at the junction of the river Nièvre, in 46° 59¼′ N. lat., 3° 10′ E. long., 133 miles S. by E. from Paris, and has 15,007 inhabitants. The town is built on the slope of a hill above the Loire, and presents a pretty aspect when seen from the left bank of the river. The streets however are narrow, steep, and irregularly built. The entrance to Nevers from Paris is by the triumphal arch erected on the occasion of the victory of Fontenoy. The chief public buildings are—the cathedral; the churches of St.-Etienne and St.-Sauveur; the old castle which forms one side of the principal square in the town; the barracks, the arsenal, the bridge over the Loire which has 20 arches, and the residence of the prefect of the department. Nevers gives title to a bishop, whose see is the department of Nièvre. It has tribunals of first instance and of commerce, ecclesiastical and communal colleges, and an agricultural society. The inhabitants manufacture iron-wares of massive character, cannon and shot, chain-cables, anchors, chains for suspension bridges, steam machinery and mill-work, &c. Agricultural implements, files, and other tools, earthenware, porcelain, enamel, cordage, violin-strings, glue, vinegar, candles, beer, leather, coarse woollens, and glass are also made. There is a commodious port for the river craft at the mouth of the Nièvre, and considerable trade is carried on in iron and steel, wood, coal, wines, leather, cattle, and manufactured goods.

NEVIN, or NEFYN. [Caermarthenshire.]

NEVIS, one of the Leeward Islands, is separated from St. Kitts by a channel about 2 miles wide, called the Narrows, which is navigable only by small boats. Nevis consists of a single conical mountain, of volcanic origin, rising with a gentle ascent from the sea-shore. The circumference of the island is about 24 miles, and its greatest elevation 2500 feet. The soil is for the most part a tenacious marl, and is very fertile, except on the high parts of the island, which are rocky and barren. The town, *Charlestown*, stands near the south-west end of the island, and has a tolerable roadstead, but it is somewhat difficult of approach on account of a shoal which stretches off the shore to the distance of half a mile. The exports of Nevis are sugar, molasses, and rum. The population in 1845 was 9571.

NEW BEDFORD. [Massachusetts.]

NEW BRANDENBURG. [Mecklenburg.]

NEW BRITAIN is a large island in the Pacific, situated between 5° and 7° 30′ S. lat., and 148° and 153° E. long. Up to the year 1700 it was considered a part of New Guinea, or Papua; but in that year Dampier discovered the strait which separates both islands, and is called Dampier's Strait. This strait is about 40 miles wide. New Britain is separated by St. George's Channel from the island of New Ireland. The area is estimated at 24,000 square miles. The interior of the island contains mountains of great elevation. Along the shores there are several plains of considerable extent, and also some good harbours. The island is fertile, and produces the cocoa-nut, sago, and other kinds of palms; also bananas, yams, ginger, sugar-cane, the bread-tree, bamboo, and many other plants and trees. Dogs, pigs, turtles, and fish abound. The inhabitants, who appear to be rather numerous, resemble the inhabitants of Papua or New Guinea. They are stout and well made, of a very dark colour, with curly hair, and go naked. They are a warlike race.

NEW BRUNSWICK, a British colony in North America, lies between 45° 5′ and 48° 20′ N. lat., 63° 48′ and 67° 50′ W. long. It is bounded N. by the Bay of Chaleurs and Lower Canada; E. by the Gulf of St. Lawrence, Northumberland Strait, and Nova Scotia; S. by the Bay of Fundy; and W. by the State of Maine. The area, as its boundary was settled in 1842, is 25,320 square miles. The population in 1847 was 211,473.

Surface, Soil, and Rivers.—New Brunswick may be divided into three regions, the Southern, Central, and Northern.

The Southern Region comprehends the country along the Bay of Fundy, and from 40 to 50 miles inland, and is divided into two ur equal portions by the St. John river. The western section contains the greatest part of Passamaquoddy Bay, an extensive sheet of water, which receives the St. Croix and many other rivers, and contains many islands. The coast of this section is rocky, but it does not rise to any great height. The eastern section is rather rocky and sterile. Behind the coast the country rises with a rather steep ascent,

and then extends in an uneven and broken plain, on which several hills rise to some elevation. The soil of this tract is very stony, and generally shallow; but there are several rich valleys, marked by rivers and small lakes.

The Central Region has low shores, and the rivers have sand-bars across their entrance, though there is usually a considerable depth of water on them. The country begins to rise at from twelve to twenty miles from the shores, and continues to rise till about 60 miles, where it begins to descend rather rapidly towards the St. John river at a distance of about thirty miles from its banks. This more elevated tract has an uneven surface, extending in long broad-backed ridges, most of which run east and west; it is covered with forest trees. A lower tract near the St. John is the most fertile part of the province.

The Northern Region is very hilly. The interior is little known, with the exception of the tracts bordering on the river Tobique, which are covered with the finest forests of red pine.

The largest river is the Looshtook, or St. John river, which rises far in the west, and flows for above 200 miles through Lower Canada. It enters New Brunswick near 47° N. lat., and soon afterwards forms the Great Falls; its course is interrupted by many rapids, and it passes through a chain of lakes, of which the chief is Grand Lake. Its course through New Brunswick is about 220 miles. The Petcoudiac, which falls into Shepody Bay, is about 70 miles long, and the tide flows up 40 miles. The Miramichi drains the centre of the Central Region with its numerous upper branches, and falls into the Gulf of St. Lawrence, after a course of more than 100 miles; it is navigable for large ships for about 40 miles. The Nipisighet river, which drains the Northern Region, and runs nearly 100 miles, is much broken by falls and rapids, and does not appear to be navigable for any extent.

Climate and Productions.—The climate of this colony rather resembles that of the countries along the southern shores of the Baltic than that of England. The winter may be considered as lasting four months. The winter is colder and the summer hotter than under the same parallels of latitude in Europe; the daily variations of temperature are also greater, but the transitions from dry to wet weather are by no means so sudden as in England.

The great commercial wealth of this country consists in its extensive forests, which are composed of pine, fir, spruce, hemlock, birch, beech, maple, ash, elm, and poplar. Wheat, rye, oats, barley, beans, peas, buck-wheat, flax, Indian corn, and common vegetables, are cultivated. On the alluvial grounds which occur along the banks of the numerous rivers there are fine meadows and pasture-grounds.

Wild animals are by no means numerous, though there are still bears, wolves, foxes, racoons, minks, squirrels, and beavers. Wild geese, ducks, partridges, and pigeons are the most common game. The rivers abound with salmon, eel, trout, perch, &c., and the sea near the shores with cod, haddock, mackerel, and herrings.

The mineral riches are imperfectly known; they comprise iron, coal, marble, and gypsum.

Towns.—*Frederickton*, the capital, is built on the banks of the St. John river, 85 miles from its mouth, on a flat, surrounded by the river on two sides. Vessels of fifty tons burden may ascend to this town. The streets are regular, but the houses chiefly of wood. It contains a good government-house, and several other public buildings. The population is about 3000. King's College in Frederickton is endowed by royal charter, and in connection with the college and supported out of its funds is a grammar-school, conducted on the same plan as the school of Eton College. *St. John*, the principal trading-place, has above 10,000 inhabitants; it is situated near the mouth of the St. John River, on the southern declivity of a peninsula, and on rocky and very irregular ground. It contains several good public buildings. *St. Andrews*, a thriving place at the mouth of the St. Croix river, in Passamaquoddy Bay, has 3000 inhabitants. *Newcastle*, on the banks of the Miramichi, about 20 miles from its mouth, is a thriving place, well situated for the exportation of timber.

The exports of the province are almost wholly confined to the produce of the forests and the fisheries. They were valued in 1846 at 886,763*l*. The value of imports during the same year was 1,036,016*l*.

The shipping that entered and cleared during 1846 was as follows:—

	Vessels.	Tons.
Outward	3630	549,083
Inward	3586	588,135

Ship-building forms a considerable branch of industry in the province.

The administration of the government of New Brunswick is confined to a lieutenant-governor (who is subordinate to the governor-general of the British provinces in North America), an executive and legislative council of 12 members, and a House of Assembly of 28 members. For the dispensing of justice there is a supreme court, with a chief justice and three puisne judges. There are also a court of chancery, a vice-admiralty court, and a court for the probates of wills and granting of administration to intestates.

NEW CALEDONIA, an extensive island in the Pacific, is situated between 17° 57′ and 23° S. lat., and between 163° and 168° E. long. This island extends from N.W. to S.E. more than 400 miles, but is of inconsiderable width. In the broadest part it is hardly 60 miles wide. On all sides it is inclosed by coral reefs, which connect innumerable small sandy islands or cliffs. Hitherto only two openings have been found in these reefs by which the island can be approached by vessels, and there are only two harbours in which large vessels can anchor with security, on the north-eastern shores, Port Balade, and on the south-western, Port St. Vincent. From the shores the country gradually rises inland to a mountain-range which traverses the island in all its length, and rises in some parts to 2000 or 3000 feet above the sea. This island is less fertile than most other islands of the Pacific. The inhabitants live mostly on yams and fish. The sugar-cane

and banana are cultivated to some extent. Cocoa-nut palms, bread-fruit-trees, and mango-trees abound on the shores. The inhabitants are stoutly made, and of a very dark colour. They eat their enemies. Cook discovered this island in 1774.

NEW COLLEGE, Oxford, was founded in 1386, by William of Wykeham, bishop of Winchester and lord high chancellor of England, for a Warden, 70 fellows and Scholars, 10 Chaplains, an Organist, 3 clerks, and 16 Choristers. The Fellows and Scholars are elected from the College of Winchester, where an election is held annually by the wardens of both colleges, two Fellows of New College, and the sub-warden and head-master of Winchester College, to supply the vacancies which may happen in the course of the ensuing year at New College. The visitor is the bishop of Winchester.

Most of the buildings of the founder in this college, after a lapse of more than four centuries, remain substantially entire. Wykeham's whole design may be still traced throughout, and the hall, chapel, cloisters, groined gateways, and even the original doors and windows, in many instances, remain undisturbed. The chapel was restored by Wyatt in 1789, and is rich both in ancient and modern painted glass. The tower of this college, a pattern of massive strength, and one of the great features in the general view of Oxford, stands on the site of one of the bastions of the old city wall. The more recent buildings in what is called the garden court of the college were finished in 1684.

In January, 1848, there were 160 members upon the books of this college.

NEW FOREST. [HAMPSHIRE.]

NEW GEORGIA ARCHIPELAGO, also called *Solomon's Islands*, constitutes one of the most extensive groups of islands in the Pacific. They are situated between 5° and 10° 50′ S. lat., and 154° 35′ and 162° 25′ E. long. They were discovered by the Spanish seaman Mendana, in 1567; visited for the second time by Carteret, and afterwards by several French and English navigators. Many parts of these islands have not yet been seen by any navigator. The largest islands from north to south are—Bougainville's Island, which is about 60 miles long; Choiseul, which is perhaps as long; San Isabella, perhaps the largest of the group; Georgia, which extends 40 miles from east to west; Guadalcanar, which is 70 miles long; and San Cristoval, which is about the same size. Besides these there are several islands of less extent, and a great number of small islands. The interior is rugged, and frequently mountainous. Mount Lammor, on the island of Guadalcanar, is compared in elevation with the Peak of Teneriffe. The hills and mountains are generally covered with lofty trees, and the valleys are generally well cultivated and very fertile. Bananas, yams, sugar-cane, and ginger are extensively cultivated. The inhabitants belong to the race of Australian negroes.

NEW HAMPSHIRE, one of the United States of North America, is situated between 42° 41′ and 45° 11′ N. lat., and 70° 45′ and 72° 30′ W. long. It is bounded E. by the Atlantic Ocean and Maine; N. by Lower Canada; W. by Vermont; and S. by Massachusetts. The length N. to S. is 160 miles; the breadth varies from 19 to 90 miles. The area is 9280 square miles. The population in 1840 was 284,574, of whom none were slaves.

Surface.—The shores are rather low, and the country along them, to the distance of 20 or 30 miles inland, is in general level; but the land rises imperceptibly, so as to arrest the tides within 20 miles from the sea, though they rise to about 18 feet This flat tract has a sandy soil of inferior fertility. At the back of it the surface becomes broken and hilly, and the hills gradually rise in elevation as they proceed farther inland, until, at a distance of about 10 miles from the banks of the Connecticut, they constitute a continuous range, running nearly N. and S. Some of the summits attain a height of 4500 feet. On approaching 44° N. lat. the chain expands into an extensive mountain group, which is known by the name of the White Mountains. The highest summit of this group, Mount Washington, is the highest mountain in the United States east of the Rocky Mountains, and attains an elevation of 6234 feet. From the northern side of the White Mountains the chain continues on both sides of the river Androscoggin, but it does not attain a great elevation. The country between this northern portion of the chain and the Connecticut is hilly, rocky, and very thinly settled, the climate being cold and the soil barren. South of the White Mountains the soil is good, but in general better calculated for pasturage than for tillage.

Rivers and Lakes.—The Connecticut rises near the northern border of the state, in Lower Canada, and soon begins to form the boundary-line between New Hampshire and Vermont. [CONNECTICUT.] The Merrimack rises in the White Mountains and traverses the central districts of the state by a southern course. [MASSACHUSETTS.] The Piscataqua, which for about 40 miles forms the boundary between this state and Maine, rises near the southern declivity of the White Mountains in a small lake, and runs S.S.E. about 60 miles in a straight line. Its course is very rapid, and the tide ascends it only a short distance from the sea; but it forms the fine harbour of Portsmouth.

This state contains several lakes. The largest is Lake Winnepisseogee, which is 25 miles long, and from 1 to 10 miles wide. Squam Lake, to the N.W., is 5 miles long and 4 wide.

Climate.—The climate of the lower districts may be compared with that of the countries along the eastern shores of the Baltic. Frost occurs sometimes towards the end of September, and the rivers are generally frozen over in November. The snow generally lies on the ground till April, and in the more elevated parts till May.

Productions.—The low lands along the rivers yield rich crops of wheat and rye, also flax, hemp, and culinary plants. Barley, oats, peas, and beans, are also grown. The uplands produce only moderate crops, but there is much good pasture-land. Horned cattle are abundant, and the dairies very

good. Sheep and pigs are also common; but horses are not numerous, and they are of a small size.

The hills and mountains are still almost entirely covered with extensive forests, consisting of pine, fir, oak, cedar, hemlock, beech, maple, balsam, poplar, birch, hickory, spruce, chestnut, and larch. The most common animals in the forests are the black bear, the wolf, fox, wild cats, racoons, and squirrels. This state is rich in minerals, among which are iron, copper, and lead.

Commerce.—The foreign commerce of the state is concentrated in the harbour of Portsmouth, but it is of small amount. Only American vessels are employed in it. Formerly the commerce with the West Indies was considerable, but it has much declined since 1812.

Divisions and Towns.—New Hampshire is divided into 10 counties. The following are the principal towns with the population of each in 1840:—*Concord*, the capital of the state, is situated on both sides of the Merrimac, 65 miles N.N.W. from Boston, in 43° 12′ N. lat., 71° 29′ W. long. There are two bridges across the Merrimac. The town contains a state-house of granite, a court-house, gaol, and five churches. Population of the township, which includes two small villages besides Concord, 4897. *Dover* is situated on the west side of the river Piscataqua, 39 miles E. from Concord, and 12 miles from the sea, at the head of the river navigation. The river Cocheco, a tributary of the Piscataqua, falls suddenly 32 feet at the point where Dover is built, and affords good water-power. Population, 6458. *Hanover*, 54 miles N.W. from Concord, is situated on the east bank of the Connecticut, over which there is a bridge connecting it with Norwich in Vermont. Dartmouth College, at this place, in 1848, had 201 students, 9 instructors, and a library of 16,000 volumes. Population, 2613. *Manchester*, 21 miles S.S.E. from Concord, is situated on the east bank of the Merrimac, where there is extensive water-power. Population, 3235. *Nashua*, 36 miles S. by E. from Concord, is situated on the west bank of the Merrimac and north bank of the river Nashua near its entrance into the Merrimac, where there is excellent water-power. There are several cotton-mills, and the town contains 8 places of worship. Population, 6054. *Portsmouth*, 45 miles E.S.E. from Concord, and 54 miles N. from Boston, is the largest town and only tide-port in the state. It stands on a peninsula on the south side of the Piscataqua, three miles from the sea. The Piscataqua, opposite the town, is more than half a mile wide, and the tide rises 10 feet, and with such rapidity as to keep the harbour free from ice. The town contains a court-house, gaol, and 8 churches. Population, 7887.

History and Constitution.—New Hampshire was first settled in 1623 at Dover and Portsmouth. It came voluntarily under the jurisdiction of Massachusetts in 1641, and was made a separate province in 1679 by an act of Charles II. The constitution was formed in 1784, and amended in 1792. The legislature consists of 12 senators, who are elected for one year, and 286 representatives, who are elected for one year. The governor is also elected for one year. The state sends 2 senators and 4 representatives to Congress.

NEW HAVEN. [Connecticut.]

NEW HEBRIDES is an extensive group of islands in the Pacific, situated, if Banks's Islands are included among them, between 13° 15′ and 20° 5′ S. lat., and between 166° 40′ and 170° E. long. The largest island, Tierra del Espiritu Santo, extends more than 70 miles from N.N.W. to S.S.E., with an average width of 25 miles. Erromanga, where the missionary Williams was killed, is one of these islands. These islands consist mostly of hills of moderate elevation, which however in some of them rise to the height of mountains. The valleys between these hills and also the level tracts along the coast are very fertile. Most of the islands are of volcanic origin. The inhabitants belong to the race of Australian negroes.

NEW HOLLAND. [Australia.]

NEW IRELAND is an island in the Pacific, situated between 2° 40′ and 4° 52′ S. lat., and 150° 30′ and 152° 50′ E. long. It is more than 170 miles long from south-east to north-west, but on an average not much more than 12 miles wide. Near the southern extremity, Cape St. George, there is a good harbour, called Port Praslin. The island has a hilly surface, and some summits rise into mountains, but all of them are covered with wood. The lower tracts are well cultivated. The inhabitants belong to the Australian negroes. New Hanover is situated farther west, and is about 30 miles long from east to west.

NEW JERSEY, one of the United States of North America, extends from 38° 55′ to 41° 21′ N. lat., and from 74° to 75° 45′ W. long. Its length N. to S. is 163 miles, and its mean breadth 46 miles. It is bounded N. by New York, E. by the Hudson and the Atlantic Ocean, S. by the Atlantic, and W. by Delaware and Pennsylvania. The area is 8320 square miles. The population in 1840 was 373,306, of whom 674 were slaves.

Surface.—About one-half of its surface S. from Staten Island is so level that it is difficult to distinguish the watershed of the streams which fall into the ocean from those which empty themselves into Delaware Bay. All this tract is covered with a sea-sand alluvium. Along its eastern shores there is a series of long, narrow, and low islands. The northern half of the State is hilly, but the hills are of moderate elevation, and the wide valleys between them have a good loamy soil. The hilly tract covers somewhat more than one-fourth of the surface of New Jersey. The most northern portion is divided between a marshy tract along the banks of the river Hudson, and a mountainous tract consisting of two ridges which traverse the north-western corner of the state in a direction S.W. and N.E. These ridges are mostly covered with forest trees, and the country between them has a good soil.

The large rivers of this state are those which constitute its boundary, the Hudson [New York] and the Delaware [Delaware]. A canal has been cut between these two large rivers, called

Morris Canal, which traverses the northern districts of the state, and there are two other canals in the state. Among the minor rivers the Raritan is the largest. It traverses the hilly district and falls into Amboy Bay, which is a good harbour for vessels of middling size. The Raritan is navigable for 16 miles from its mouth. Newark Bay receives the Hackensack and the Passaic, of which the former is navigable for 16 miles, and the latter for about 10 miles from its mouth. The Maurice River, which empties itself into Delaware Bay, at the southern extremity of the state, is navigable for vessels of 100 tons to a distance of 20 miles from its mouth.

Climate.—The difference of climate between the southern and northern districts is very great, and depends mainly on the difference of elevation. The level sandy plains of the southern districts admit the cultivation of cotton, while the mountainous northern districts experience early and severe winters.

Productions.—Wheat, rye, Indian corn, oats, barley, buck-wheat, flax, and potatoes, are the common crops; buck-wheat is in very general cultivation. The cotton grown in the southern district is consumed for the domestic manufactures. Apples, pears, peaches, plums, and cherries are the common fruit-trees. In the mountainous parts and salt-marshes near the sea-coast great numbers of cattle are raised. Sheep are also kept in great numbers. The forests are composed of oak, hickory, chestnut, poplar, ash, &c. The larger wild animals have nearly disappeared, and only the racoon and fox abound. Iron abounds in the mountainous and hilly district, and bog iron is found in the marshes along the sea. There is also copper, and in the primitive rocks of the mountainous districts some gold, silver, and galena.

Commerce.—The commerce of the State is considerable, though it is checked by the vicinity of New York and Philadelphia, to which the produce of the country is sent. This produce consists of live cattle, fruit, iron, butter and cheese, hams, flax-seed, cider, lumber, and some manufactures, especially leather, glass, cotton-cloth, and iron-ware. There are several railroads in this State.

Divisions and Towns.—New Jersey is divided into 18 counties. The following are the principal towns, with the population of each in 1840 :—*Burlington*, a city and port of entry, 12 miles S. from Trenton, is situated on the east bank of the Delaware. It contains 8 churches. Population, 3434. *Camden*, a city and port of entry, 29 miles S.S.W. from Trenton, is situated on the east side of the Delaware, opposite Philadelphia. It has railway communication with New York, and there are ferries to Philadelphia. Population, 3371. *Jersey*, a city, 58 miles N.E. from Trenton, is situated on the west side of the Hudson, opposite New York, with which it is connected by a ferry. Population, 3072. *New Brunswick*, a city, 27 miles N.E. from Trenton, is situated on the west bank of the Raritan, 14 miles from its entrance into Raritan Bay. It contains a court-house and 7 churches. The Delaware and Raritan Canal extends from New Brunswick 43 miles to Trenton, and the New Jersey Railroad passes through the city, connecting New York with Philadelphia, Baltimore, and Washington. Population, 8693. *Newark*, a city and port of entry, 9 miles W. from New York, and 49 miles N.E. from Trenton, is situated on the west side of the river Passaic, 3 miles above its entrance into Newark Bay, and is the largest and most flourishing place in the State. There is steam-boat communication twice a day with New York, and railroad communication several times a day. Vessels of 100 tons burden can come up to the city, and the commerce is considerable and increasing. The streets are regularly laid out and well built, and there are 17 churches. Population, 17,290. *Paterson*, 75 miles N.E. by N. from Trenton, is situated on the Passaic, near the great falls, where by means of a dam a vast water-power is obtained. It contains a court-house, gaol, many manufactories, and 9 churches. Population, 7596. *Princeton*, 11 miles N.E. from Trenton, contains New Jersey College, which in 1848 contained 240 students, 13 instructors, and a library of 14,000 volumes. Population, 3055. *Trenton*, a city, the capital of New Jersey, is situated in 40° 13′ N. lat., 75° 48′ W. long., on the east side of the Delaware, opposite the falls. It is at the head of the steam-boat and sloop navigation. It contains a state-house, governor's house, and 7 churches. The city contains about 2000 inhabitants, but including the suburban villages, 4035.

History and Constitution.—New Jersey was first settled by the Dutch in 1612, in those places contiguous to the Hudson. The Swedes established themselves here in 1628, but their settlements soon fell into the possession of the Dutch, who were supplanted by the English in 1664. New Jersey was then a part of New York, from which it was definitively separated in 1736. It declared itself early against England in the revolutionary struggle, and published its present constitution July 2, 1776, two days before the declaration of independence by the Continental Congress. The legislature consists of 18 senators, who are elected for 3 years, and 58 representatives, who are elected for one year. The governor is elected for 3 years. The State sends 2 senators and 5 representatives to Congress.

NEW LONDON. [CONNECTICUT.]

NEW SOUTH SHETLAND is a group of islands situated south-south-east of and about 600 miles from Cape Horn, between 61° and 63° 30′ S. lat., and 53° and 63° W. long. They extend from east-north-east to south-south-west, over a space of nearly 300 miles, and consist of twelve islands of moderate extent, and a great number of rocks and cliffs. They were discovered in 1819 by Captain Smith, and have frequently been visited since that time for the purpose of taking fur-seals and sea-elephants, with which the shores abound. The islands seem to be of volcanic origin, and are uninhabited.

NEW TESTAMENT. [TESTAMENT.]

NEW-YEAR'S DAY, with us, like many others, in modern times, has lost much of the ceremonials of its observance, which consisted principally in making presents—a custom that seems to have been derived from the Romans.

Gifts at new-year's-tide formed a charge of no small amount in the privy-purse expenses of royalty, from very early times to the time of Charles II.: they were mostly made in plate. The modern Jews, on the first day of the month Tisri, which may be considered as their new-year's day, usually have a splendid entertainment, and wish each other a happy new-year.

NEW YORK, one of the United States of North America, lies between 39° 45′ and 45° N. lat., and 73° and 79° 55′ W. long. It is bounded N. by Lake Ontario, the river St. Lawrence, and Lower Canada; S. by the Atlantic Ocean, New Jersey, and Pennsylvania; E. by Vermont, Massachusetts, and Connecticut; and W. by Lake Erie and the river Niagara. Its greatest length, N. to S., is 316 miles; its greatest breadth, E. to W., is 314 miles. The area is 46,000 square miles. The population in 1840 was 2,428,921, of whom none were slaves.

Surface.—Two chains of hills, rising in some parts to mountains, pass along the eastern part of the state. The principal chain enters from Pennsylvania, and forms the Catskill Mountains. Extending N. it crosses the Mohawk, and forms in the N.E., opposite Lake Champlain, some high summits, called the Adirondack Mountains. The highest peak of the Catskill Mountains is Round Top, 3,804 feet high. The other chain, called the Highlands, entering the state from New Jersey, crosses the Hudson, and forms the boundary between New York and the states of Connecticut and Massachusetts, till declining more to the east it joins the Green Mountains of Vermont. The Essex Mountains are situated entirely within the state of New York. They occupy the country between 43° 20 and 44° 30′ N. lat., and extend from the western shores of Lake Champlain to about 74° 30′ W. long. West of the Essex Mountains an elevated table-land extends to about 75° 40′ W. long. The eastern part of the state, where it is not mountainous, is hilly; the western part is an extensive level tract, except in the south, towards Pennsylvania, where it is uneven and rough. The soil is generally good, and in some parts very fertile. The eastern part is best adapted for grazing and the west for tillage.

Islands.—Long Island, Staten Island, and Manhattan Island, are also included in the state of New York. Long Island is 120 miles long, and the average width is about 10 miles. It is separated from Connecticut and the mainland of New York by Long Island Sound. Staten Island, E. of Long Island, is 18 miles long, and 8 miles wide. Manhattan Island, on which the city of New York is built, is 15 miles long, and the average width is about 1½ mile.

Rivers and Lakes.—The *Hudson*, the largest river of the state, rises in two branches, which unite about 43° 30′ N. lat., when the river flows S. with great rapidity, and then E., and is precipitated over the Great Falls. Twenty miles lower down are Glen's Falls, below which the river is navigable, though rapid. The tide rises to the mouth of the Mohawk River, below which the average width is somewhat less than a mile. About 30 miles from its mouth, which is between Sandy Hook in New Jersey and the western extremity of Long Island, the river divides into two arms, which enclose the island of Manhattan. The eastern arm is called Haerlam River, and after it has united to Long Island Sound, East River. Where the river meets Long Island Sound is a dangerous strait in which it forms whirlpools and eddies. At the city of New York the East River unites again with the West River or proper Hudson, and the spacious Bay of New York is formed. But before the river enters the sea, it sends off another arm to the westward, which separates Staten Island from New Jersey. The Hudson is navigable for ships to Albany, 120 miles from its mouth, and to Troy, 36 miles farther up for sloops. The whole course of the Hudson is 324 miles.

The Mohawk River is the only considerable tributary of the Hudson, which it enters on the west bank after a course of 135 miles. It contains the Trenton Falls, the Little Falls, and the Cohoes Falls, and is not navigable, but the Erie Canal, or Grand Canal, runs by its side.

The Genesee, 125 miles long, and the Black River, 120 miles long, fall into Lake Ontario. The Saranac, 65 miles long, falls into Lake Champlain. The Oswegatchie flows 100 miles and falls into the St. Lawrence. The Oswego flows 40 miles from Lake Oneida to Lake Ontario.

Not far from the eastern banks of the Genesee commences that remarkable series of lakes, which extend nearly 100 miles farther eastward, and are from 20 to 30 miles distant from Lake Ontario. These lakes extend in length from south to north, or rather, lines drawn from their most northern extremity, in the direction of their length, to Lake Ontario, cut the shores of that lake at right angles. The most considerable of these lakes, from west to east, are, Lake Canandaigua, which is 14 miles long, and from one to two wide; Crooked Lake is 13 miles long, and about 1¼ mile wide; Seneca Lake is 35 miles long and from 2 to 4 miles wide; Cayuga Lake is 38 miles long and from 1 to 4 miles wide; Skeneatiles Lake is 15 miles long and from ½ to 1½ mile wide; and Oneida Lake, the most eastern, is 20 miles long and 4 miles wide. Onondaga Lake, which lies between Lake Skeneatiles and Oneida Lake, is 6 miles long and 2 wide, and remarkable for the copious and strong salt springs, which occur at a distance of a mile from its eastern banks. All these lakes, except the most western, that of Canandaigua, discharge their water by one river, the Seneca, which issues from the northern extremity of Lake Seneca, and winds with numerous bends through the Lake Country, running in a general N.E. direction. Lake Erie, Lake Ontario, and Lake Champlain, form portions of the boundary of the state. [CANADA; CHAMPLAIN, LAKE.]

Climate.—The mean annual temperature of the city of New York is between 52° and 53°, which is only 2° or 3° higher than that of London, though it is more than 10° nearer to the equator. But this city has a milder climate than any other part of the state, except Long Island. The valley of the Hudson river is much colder than any part of Great Britain. In January and February the thermometer sometimes sinks to 2° Fahr., and

river is passed on the ice, which usually does not break up before the end of March. In summer the thermometer ranges between 60° and 80°; it sometimes rises to 85°, and for a few days to 90°, but rarely higher. The cold is much more severe towards the northern part of the vale of the Hudson. The Lake Country, on the contrary, enjoys a milder climate, its temperature being generally at least three degrees higher than that of the valley of the Mohawk.

Productions.—Maize, wheat, rye, barley, oats, and buck-wheat, potatoes and turnips, are generally cultivated. Immense quantities of melons are raised. Peas and beans succeed very well. Apples, peaches, and cherries are plentiful. In some parts flax and hemp are grown, especially in the Lake Country. All the domestic animals of England are reared in New York with success.

A considerable part of the state is still covered with forests, which consist of oak of different species, ash, walnut, pine, maple, beech, chestnut, birch, poplar, elm, cedar, hemlock, and hickory. Deer are still frequent in the western districts and northern region. Other wild animals are, wolves, bears, gray and red foxes, racoons, skunks, minks, beavers, otters, squirrels, and hares. Swans, wild geese, ducks, and pigeons are abundant.

Several minerals occur in abundance, but only iron, salt, limestone, and marble are worked. Coal is imported from various places, especially from Nova Scotia.

Canals and Railroads.—The canals and railroads are numerous. The Erie Canal extends from Albany to Buffalo, 363 miles, and is now in the process of widening, the expense of which it is estimated will be equal to the original cost of making. Three or four branch canals are connected with the Erie Canal. The Champlain Canal extends from Albany to Whitehall, 79 miles. The Genesee and Alleghany Canal extends from Rochester to Olean on the Alleghany, 107 miles. The Delaware and Hudson Canal begins on the Rondout Creek, near the Hudson, passes through the river Delaware, and extends to Honesdale, on the Lakawaxen, 109 miles. The New York and Erie Railroad is perhaps now (Aug. 1849) completed, and if so it extends from Piermont, 22 miles above New York, to Dunkirk, on Lake Erie. The other railways are too numerous to be specified, and there are several new ones in progress.

Manufactures and Commerce.—In 1840 there were 323 woollen manufactories, 890 fulling mills, 186 iron furnaces, 120 forges, 77 paper-mills, 1216 tanneries, and a great variety of other works. The commerce greatly exceeds that of any other of the States. In 1840 the exports amounted to 34,264,080 dollars; the imports to 60,440,750 dollars.

Divisions and Towns.—The state is divided into 58 counties. The following are the principal towns, with the population of each in 1840:—*Albany*, is the capital of the State. [ALBANY.] *Auburn.* [AUBURN.] *Black Rock* is situated near the foot of Lake Erie, 2½ miles below Buffalo, of which it may be considered a suburb. Population, 1800. *Brooklyn.* [BROOKLYN.] *Buffalo.*

[BUFFALO.] *Hudson*, a city and port of entry, 116 miles N. from New York and 29 S. from Albany, is situated on the east bank of the Hudson, at the head of the ship navigation. Population, 5672. *Ithaca*, 162 miles W. by S. from Albany, is situated on a plain 1½ mile S. from the head of Cayuga Lake. Population, 5650. *Lansingburg*, 10 miles N.E. from Albany, is situated on the east bank of the Hudson, at the head of the sloop navigation. Population, 3330. *Little Falls*, 91 miles W.N.W. from Albany, is situated on both sides of the Mohawk River. The river falls 42 feet, and affords a great water-power. Population, 3881. *Lockport*, 277 miles W. by N. from Albany, is situated on the Erie Canal, and contains a court-house, gaol, and 12 churches. An immense water-power is here obtained from the surplus water of the Erie Canal, which is here raised 60 feet by 5 double locks. Population, 9125. *New York.* [NEW YORK.] *Newburg*, 84 miles S. by W. from Albany, is situated on the west bank of the Hudson, and contains a court-house, gaol, and 11 churches. Steam-boats ply between Newburg and Albany and New York. Population, 8939. *Oswego*, 160 miles W.N.W. from Albany, stands on both sides of the river Oswego, at its entrance into Lake Ontario, and contains a court-house and 5 churches. Population, 4500. *Plattsburg*, 163 miles N. from Albany, is situated on both sides of the river Saranac, at its entrance into Cumberland Bay in Lake Champlain. The river has here a succession of falls, and affords good water-power. Population, 6416. *Rochester*, a city, 220 miles W. by N. from Albany, is situated on both sides of the Genesee, which is crossed by three bridges. The Erie Canal here crosses the Genesee by an aqueduct, and the Great Western Railway passes through the town. It contains a court-house, gaol, and 22 churches. The Genesee Falls here afford a vast water-power, on which the prosperity of the town chiefly depends. Population, 20,191. *Rome*, 107 miles W. by N. from Albany, is situated on the Mohawk River and Erie Canal. The Black Canal here unites with the Erie Canal, and the Syracuse and Utica Railway passes through the town. Population, 5680. *Salina*, 133 miles W. by N. from Albany, is situated at the east end of Onondaga Lake, and is celebrated for its salt-springs, from which about 2,250,000 bushels of salt were manufactured in the year 1840. Population of the township, 11,013. *Schenectady*, a city, 16 miles W.N.W. from Albany, is situated on the S. bank of the Mohawk River. It contains a city-hall, a gaol, 9 churches, and Union College, which in 1848 had 304 students, 12 instructors, and a library of 16,000 volumes. Population, 6784. *Seneca Falls*, 166 miles W. from Albany, is situated on both sides of the outlet of Seneca Lake, which affords a great water-power. The town contains 5 churches and a population of 4281. *Syracuse*, 131 miles W. by N. from Albany, is situated on the Erie Canal, at the junction of the Oswego Canal. A large quantity of fine salt is manufactured here from salt-springs in the neighbourhood. The town contains a court-house and 6 churches. Population, 6500. *Troy*

a city and port of entry, 6 miles N. from Albany, is situated on the east side of the Hudson, at the head of the tidewater, and has a great commerce by sloops and steam-boats. The town contains a court-house of marble, a gaol, and 18 churches. A railroad connects Troy with Ballston Spa, where it joins the Schenectady Railroad to Saratoga. Population, 19,334. *West Troy*, on the west bank of the Hudson, is a suburb of Troy, with which it is connected by a bridge and two ferries. Population, 5000. *Utica*, a city, 92 miles W. by N. from Albany, stands on the south bank of the Mohawk River. The Erie Canal passes through the city. The town contains a State Lunatic Asylum, several literary institutions, and 18 churches. Population, 12,782. *Watertown*, 164 miles N.W. from Albany, is situated on the south bank of Black River, which has here a fall of 88 feet in one mile, and affords an immense water-power. The town contains 7 churches. Population, 5027.

History and Constitution.—The Hudson River was discovered by Henry Hudson, an Englishman in the service of the Dutch. The first permanent settlement was made by the Dutch on Manhattan Island in 1614. In 1664 the English took the country, and by the treaty of Breda the Dutch confirmed the colony to the English. In 1673 the Dutch retook the city of New York, but it was restored to the English by the treaty of Westminster in the following year. In 1788 New York adopted the constitution of the United States. The present constitution was adopted in 1821. The legislature consists of 32 senators, who are elected for two years, and 128 representatives, who are elected for one year. The governor is elected for two years. The State sends 2 senators and 34 representatives to Congress.

(Haskel and Smith, *Gazetteer of the United States of North America; American Almanac*, 1848.)

NEW YORK, the principal city of the State of New York, and the largest city of the United States, is situated in 40° 42′ 40″ N. lat., 71° 1′ 8″ W. long., on the south end of Manhattan Island, at the confluence of the Hudson with the strait called East River. The population in 1840 was 312,710.

The situation of New York as a commercial port is admirable. New York Bay, which is completely land-locked, is about 8 miles long and from 1½ to 5 miles wide, and affords a perfectly safe anchorage. It is easy of approach, and is very rarely closed by ice. The entrance between Long Island and Staten Island, by a channel called the Narrows, is protected by forts, while the approach to it is facilitated by light-houses. The bay contains several small islands, on which fortifications have been constructed. There is sufficient depth of water, both in the Hudson and East River, for ships of large burthen to load and unload at the wharfs. The commercial intercourse with the interior and with the western States of the Union is provided for by means of the Hudson, and the system of canals connected with it.

The city of New York extends along the Hudson about 2 miles, and along the East River, which divides it from Long Island, about 4 miles. The south-west part of the town, which was the earliest built, is ill-arranged, but the more modern parts are laid out with much regularity, and are well paved and lighted. Broadway, the principal street, which runs through the centre of the town, is three miles long and 80 feet wide. It contains several handsome churches, many of the principal hotels, and a great variety of elegant shops. Wall Street, which branches off from Broadway, contains the Exchange and most of the city banks, as well as the greater part of the merchants' and brokers' counting-houses, and the insurance offices. The City Hall, the front of which is of white marble, is 216 feet long, 105 feet wide, and 60 feet high. It contains the courts of law and the places of meeting for the municipal bodies. It is finely situated in the middle of the Park. The Merchants' Exchange, rebuilt since the great fire in December, 1835, is the most splendid building in the city, though the situation does not exhibit it to advantage. It is built of blue granite, and is 200 feet long, by 171 and 144 feet wide; it is 77 feet high to the top of the cornice, and 12 feet to the top of the dome. The Custom House is of white marble, somewhat resembling the Parthenon. The other principal buildings are—the Hall of Justice, of light-coloured granite; the Hall of the University of New York, a handsome gothic building; Columbia College; Trinity Church, in the Broadway, recently completed, a very fine gothic structure; St. Paul's Episcopal Church with a steeple 231 feet high; St. John's Episcopal Church, with a steeple 240 feet high; and the Dutch church, a handsome gothic building. Several other churches are fine structures. There are altogether about 170 churches, of which 2 are Episcopal, and 25 Presbyterian, the rest belonging to a great variety of religious sects.

The Battery is a beautiful public ground on the south point of the island, containing 11 acres; the Park, in the city, is laid out in walks shaded with trees, and contains 10¾ acres. There are several squares.

The most expensive and useful public work undertaken by the city is the aqueduct called the Croton Water-Works, which conveys a supply of pure river water sufficient for the city if it were five times its present size. The dam at the Croton River is 38 miles from the reservoir at New York, which covers 4 acres, and holds 20 millions of gallons.

New York contains about 30 banks, 6 theatres, 2 museums, 2 colleges, and a great number of academies and schools; besides literary institutions and charitable institutions, of which the number is very large. There are 12 daily papers, of which 125,000 copies are issued, and 9 semi-weekly papers; 54 monthly magazines, and 3 quarterly magazines.

The shipping belonging to the port in 18[illegible] averaged 414,817 tons; the imports for the year 1841 amounted to 75,268,015 dollars; the exports to 30,731,519 dollars; and the amount of duties paid at the port to 10,802,119 dollars. One li[illegible]

of steam ships connects New York with Liverpool, and another with Southampton; besides which several lines of packets connect it with London, Liverpool, and other places.

The city is divided into 17 wards, and the government is conducted by a mayor, aldermen, and common council.

NEWARK. [New Jersey.]

NEWARK-UPON-TRENT. [Nottinghamshire.]

NEWBURG. [New York.]

NEWBURY. [Berkshire.]

NEWBURYPORT. [Massachusetts.]

NEWCASTLE. [Limerick.]

NEWCASTLE-EMLYN. [Caermarthenshire.]

NEWCASTLE-UNDER-LYME. [Staffordshire.]

NEWCASTLE-UPON-TYNE. [Northumberland.]

NEWCOME, WILLIAM, born 1729, died 1800. His father was a clergyman at Abingdon, Berkshire, and he was educated at the grammar-school in that town. After becoming a fellow of Hertford College, Oxford, he went to Ireland with the Earl of Hertford, the lord-lieutenant, who appointed him to the see of Dromore, from which he was translated first to Ossory, then to Waterford, and finally to Armagh. His first work was 'The Harmony of the Gospels,' out of which arose a controversy with an acute antagonist, Dr. Priestley, on the duration of the ministry of our Saviour. In 1782 he published his 'Observations on our Lord's Conduct as a Divine Instructor, and on the Excellence of his Moral Character;' and in 1785 a new version, with critical remarks, of the Twelve Minor Prophets. This was followed in 1788 by a similar work on the prophet Ezekiel. In 1792 he published his 'Review of the Chief Difficulties in the Gospel History relating to our Lord's Resurrection;' and in the same year, 'An Historical View of the English Biblical Translations.' After his death was published 'An Attempt towards revising our English Translation of the Greek Scriptures.'

NEWENT. [Gloucestershire.]

NEWFOUNDLAND, an island belonging to the British, is situated in the Atlantic Ocean, not far from the eastern shores of North America, between 46° 40′ and 51° 37′ N. lat., and 52° 25′ and 59° 15′ W. long. On the north-east, east, and south it is surrounded by the Atlantic Ocean. On the west is the Gulf of St. Lawrence, which communicates at the northern extremity of the island with the Atlantic by the strait of Belle Isle, which is about 60 miles long and 12 broad. The surface of Newfoundland is estimated at nearly 60,000 square miles.

The shores are rocky and high, and indented by broad and deep bays, which enter from 40 to 60 miles into the body of the island. The lands adjacent to the sea are bleak, rugged, and nearly destitute of trees or bushes; but at the heads of the bays and near the mouths of the rivers there are flats of some extent covered with trees. The interior of the island is nearly unknown: it seems to be diversified by hills, rivers, and numerous lakes.

The climate is generally cold and humid. It is not so severe as to prevent cultivation, but it has hitherto been attempted only to a moderate extent. There is a scarcity of timber.

Deer are numerous, but beavers are not so common as they were formerly. Foxes are still numerous along the rivers and sea-coast. Fishing is at present almost the only occupation of the inhabitants: they take seals on the floating ice-fields in the spring, and cod in the summer along the eastern and southern coasts of the island, the coast of Labrador, and the Great Bank. Salmon, herring, and mackarel are also taken.

Coal, gypsum, and limestone are found in several districts, especially on the western coast, near St. George's Bay.

In the interior of the southern districts there is still a native tribe, the Mic-mac. All the European settlers live near the coast.

The port and town of *St. John's* is on the east side of the island. The harbour is spacious, and sheltered on all sides by high rocks: its fortifications are rather strong than extensive. The town runs along nearly the whole of the north side of the port, but there can scarcely be said to be more than one street, the others being irregular lanes. A few of the houses are of stone or brick, and some of the buildings are handsome, but the greater part are of wood. The public and government buildings are tolerably extensive. The population in summer hardly exceeds 10,000, but on the return of the fishermen it is increased to 15,000. *Harbour Grace*, the next town in importance, has a population of 5000. The other settlements are small, and chiefly consist of a few wooden houses.

The Great Bank of Newfoundland is the most extensive submarine elevation that is known to exist in any ocean. It is about 600 miles long, and in some places 200 broad. The whole appears to be a mass of solid rock; its edges are abrupt, and deepen suddenly from 25 to 95 fathoms. The Outer Bank seems to be a continuation of the Great Bank at a lower elevation.

The first discovery of Newfoundland is due to some Norwegians, who, before the year 1000, sailed on a voyage of discovery from Greenland, and visited various parts of North America. The existence of Newfoundland however seems to have been forgotten until its re-discovery, on the 24th June, 1497, by John Cabot, then in the service of England. By the year 1500 fishermen reached as far as Newfoundland from Europe. No attempt was made to form a settlement on the island until 1536; and no success attended any attempts until the next century, when Lord Baltimore in 1623, Lord Falkland in 1633, and Sir David Kirk in 1654, formed settlements on the island. The island has ever since belonged to England; but there have been repeated disagreements between England and France respecting the rights of fishery there.

The population of Newfoundland has always been very fluctuating. The sole inducement to settlers is offered by the fisheries, for the prosecution of which many persons take up their abode on the island only during the fishing season, and

leave it during the winter. The last census gives a population of 75,094.

The produce of the fisheries, consisting principally of cod-fish and salmon, together with train-oil and furs, amounts to 800,000*l.* or 900,000*l.* annually.

The inhabitants are in a great degree dependent for provisions upon importation. Salt provisions are sent from Ireland and Germany; large quantities of biscuit are also sent from Germany, flour is imported from the United States of America and from the north of Europe, and Indian corn meal from the United States.

NEWFOUNDLAND DOG, a well-known and fine variety of the dog, seldom seen in a state of purity, when it is comparatively small, but very muscular and strong, and generally black. The large, and, it must be confessed, handsome dogs, which are so often seen in this country, and pass for Newfoundland Dogs—'dogs—(it is Col. Hawker, if we recollect right, who so designates them) as big as a jackass and as hairy as a bear'—are very different from the compact and moderate-sized animals, which, in their native country, are employed in drawing sledges and little carriages laden with wood, fish, or other commodities. Some of these true Newfoundland Dogs we have seen, and they make admirable retrievers. We have also seen the great and less pure English Newfoundland Dogs, so to speak, employed in the field for the same purpose with great success. Of the aquatic propensities and powers of this breed of dogs little need be said. Numerous are the instances which might be collected of the gallant mode in which these dogs have rescued human beings from a watery grave. Sagacity, courage, and fidelity, are the characteristics of this noble race.

NEWHAVEN. [SUSSEX.]

NEWMARKET. [SUFFOLK.]

NEWNHAM. [GLOUCESTERSHIRE.]

NEWPORT. [MONMOUTHSHIRE; WIGHT, ISLE OF.]

NEWPORT-PAGNELL. [BUCKINGHAMSHIRE.]

NEWRY. [DOWN.]

NEWT. [EFT.]

NEWTON, ISAAC, was born Dec. 25, 1642, Old Style, at Woolsthorpe, near Grantham. From the pedigree registered upon oath in the Heralds' Office, by Newton himself, in the year 1705, it appears that his family was resident at Westby in Lincolnshire until it became possessed of the manor of Woolsthorpe. His mother was left a widow during her pregnancy, and appears to have given premature birth to her child, which was of extremely diminutive size. Mrs. Newton soon contracted a second marriage with the Rev. Barnabas Smith, rector of North Witham, whereupon her son, then about three years old, was confided to the care of his maternal grandmother, by whom he was sent to two day-schools, and then to the free grammar-school of Grantham. While here he evinced considerable aptitude for mechanical contrivances. Mrs. Newton's second husband, in 1656, induced her to return to the manor of Woolsthorpe, and in that year Isaac was taken from school to assist in the management of the farm. Accordingly on market-days he was sent to Grantham, accompanied by an aged domestic, either to dispose of farm produce, or to purchase such things as were needed by the family. But on these occasions it more frequently happened that Isaac stopped by the way-side, watching the motions of a water-wheel or some other piece of machinery, or if he reached the town of Grantham it was only to resort to the apothecary's garret in which he had resided while he attended the grammar-school, and where a few old books afforded him ample entertainment until his trusty companion summoned him to return home. These and other instances having shown the inutility of thwarting his studious disposition, he was shortly after sent back to Grantham school. When he had attained his 17th year it was determined to send him to Trinity College. His matriculation took place June 5, 1660.

During the first six years of his residence at Cambridge, that is, before the completion of his 24th year, he invented his Binomial Theorem, established the fundamental principles of his doctrine of Fluxions, and demonstrated the law of the force in virtue of which the planets gravitate towards the sun, although, in consequence of the erroneous measurement of the earth then in use, it was not till afterwards that he was able to show that the same law holds with respect to the moon, and that the force manifested at the earth's surface in the fall of a pebble is identical, as to its nature, with that which pervades the whole planetary system.

Wallis had suggested a method of obtaining the approximate quadrature of the circle, the practicability of which depended upon an interpolation. Newton set about effecting this, notwithstanding the discouraging declaration of Wallis, that he believed it to be impracticable. The attempt however led (1663-4) to a discovery of greater moment, the *Binomial Theorem*. This theorem combined with the previous labours of Wallis and others, supplied Newton with a method of making his other researches effectual in determining the area and rectification of curves, the surface and content of the solids formed by their revolution, and the position of their centre of gravity, and in solving other problems. The fluxionary calculus was invented by Newton in or before the year 1665, in which year he took his degree of B.A.

The raging of the plague in 1665-6, induced Newton to quit Cambridge and retire to Woolsthorpe. Here it was that he began to reflect more particularly upon the nature of the force by which bodies at the earth's surface are drawn towards its centre, and to conjecture that the same force might possibly extend to the moon, and there be of sufficient intensity to counteract the centrifugal force of that satellite, and thereby retain it in its orbit about the earth. To compare this hypothesis with observation, it was necessary to determine the law according to which the intensity of such a force would vary with the distance from the earth's centre; for although no sensible variation can be detected within the narrow limits of direct observation, namely, the

summit of the highest mountains or the bottom of the deepest mines, it was reasonable to presume that some variation would be appreciable at the distance of the moon, and in such case only could the force be just sufficient to counteract the centrifugal tendency of the revolving satellite. To a mind so habituated to generalise, it was a natural extension of his hypothesis to suppose that the same kind of force which incessantly deflects the moon from a rectilinear path might likewise act upon the planets so as to retain them in their orbits about the sun. Now the assumption of an attractive force emanating from the sun was at this time far from being a novelty, and it had even been asserted by Bouillaud that if such a force really existed, its intensity would vary inversely as the square of the distance from the attracting body; but neither Bouillaud nor those who entertained similar opinions had given any proof, either empirically or otherwise, of what they had asserted; and certainly none appear to have attempted to establish that the forces which retain the planets in their orbs were identical, as to their nature, with that which draws a stone, when let fall, to the surface of the earth. Newton showed that the law of the inverse square of the distance is that which really exists in nature; and further, that this law was a necessary consequence of the analogy already discovered by Kepler between the periodic times and the mean distances of the planets. The length of the earth's radius, which entered as a necessary element into the verification, was at that time very imperfectly known; the consequence of which was, that the result of his calculation indicated a force at the distance of the moon greater, by nearly one-sixth, than that deduced from direct observation. This difference, which many would have considered sufficiently small to establish the correctness of the hypothesis, was regarded by Newton rather as a direct refutation of its truth.

In 1666, the plague having subsided, he returned to Cambridge. He took his degree of M.A. in 1667; in 1668 he became senior fellow, and in 1669 succeeded Dr. Barrow as Lucasian Professor of Mathematics.

The discarded hypothesis having lain dormant for sixteen years, in 1679 he repeated the trial with Picard's value of a degree: but, in the course of the work, observing that the conclusion he had formerly anticipated was about to be realised, his ardour is said to have brought on a state of excitement and nervous irritability which precluded his further progress, so that the completion of the calculation was confided to a friend. [PRINCIPIA; GRAVITATION.]

In the year 1666 we learn that Newton, in common with many other philosophers at that time, occupied himself in the attempt to grind object-glasses in conformity with the precepts of Descartes and Gregory, and while thus occupied he seems to have conjectured that the defects of refracting telescopes might arise from some other cause than that which had hitherto been exclusively assigned. Either this conjecture or accident led him to consider the phenomenon of the prismatic spectrum which was then well known to philosophers, although it had been explained by none. In doing so he remarked that the angle subtended at the aperture of his shutter by the length of the spectrum was considerably greater than that subtended by the sun's diameter, though, according to the received law of refraction, these angles ought to have been sensibly equal. After modifying the experiment in various ways, and assuring himself that this discrepance did not arise from any irregularity in his prism, the thought fortunately suggested itself of trying the separate effect of the prism upon each of the coloured lights of the spectrum. Accordingly, having transmitted them successively through a second prism at the same angle of incidence, he found — 1, that the colour was in no degree affected by this second refraction; 2, that the spectrum formed by each colour occupied a distinct position on the screen, so that the deviation from the direction of the primitive ray was different in all, being greatest in the violet and least in the red. He therefore came to the important conclusion 'that light was not homogeneous, but composed of rays, some of which were more refrangible than others.' This discovery must have been made subsequent to the publication of Wallis's optical lectures, which appeared in 1669, for otherwise it is improbable that Newton, to whom the revisal of the MS. was confided, and who receives the author's acknowledgments for having 'corrected several oversights, and made some important corrections,' would have permitted his friend to promulgate views so erroneous.

In the above year however Newton began to deliver a course of lectures on optics at Cambridge, and the composition of white light formed part of the course. Seeking the complete development of the consequences of his discovery, 'he was conducted,' says M. Biot, 'to a multitude of observations no less admirable for their novelty and importance, than for the sagacity, address, and method with which he contrived, executed, and linked them one with the other.'

Although Newton had been thus successful in his optical inquiries, and had detected the principal source of indistinctness in refracting telescopes, he not only did not see how this indistinctness might be removed, but even designated all attempts as desperate; and the long interval which elapsed before the discovery of the achromatic telescope may be attributed to the unmerited reliance which in this instance was placed on his decision. By this opinion he was induced to forego all attempts to perfect the refracting telescope, and directed his attention to the construction of reflecting telescopes on the principles pointed out by James Gregory.

In 1668-9 he had succeeded; and in 1671 he executed a second telescope 'with his own hands,' which is still carefully preserved in the library of the Royal Society. It was in order to explain the phenomena exhibited by thin transparent substances, and the partial reflection and transmission of light incident upon diaphanous surfaces, that Newton devised his theory of 'fits of easy reflexion and transmission.'

In 1672 Newton was elected member of the

Royal Society. In 1675 he received a dispensation from Charles II. to continue in his fellowship without taking orders. In 1687 he was appointed one of the delegates to defend the privileges of the university of Cambridge against the attacks of James II. In 1688 he took his seat in parliament (or rather in the Convention) as one of the representatives of the university. He was returned to parliament in 1689, and in 1701, but lost his election in 1705. On no occasion does he appear to have taken any part in the debates of the house. Prior to the year 1694, when he was appointed warden of the mint, with a salary of from 500*l.* to 600*l.* per annum, his pecuniary circumstances are said to have been rather straitened. Four years after receiving the appointment of warden of the mint, he was promoted to the mastership of that establishment with a salary of from 1200*l.* to 1500*l.*, and at his death his personal estate was valued at 32,000*l.*

Some account of the mistaken notion that Newton was at one time insane, arising out of an entry in the journal of Huyghens, is in the 'Penny Cyclopædia.' In 1694 we find him actively occupied in testing his lunar theory by the observations of Flamsteed, with whom he had hitherto been on the most intimate terms. The quarrel which subsequently took place between Newton and the astronomer royal is noticed under FLAMSTEED.

In 1699 Newton was chosen foreign associate of the Royal Academy of Sciences at Paris; in 1703 he was elected president of the Royal Society, to which office he was annually re-elected till his death; and in 1705 he was knighted by Queen Anne. In 1722 he became subject to a disorder of the bladder, accompanied with cough and gout. He presided for the last time at the Royal Society on the 28th of February, 1726-7, and died at Kensington on the 20th of March following, in the 85th year of his age. His body was interred in Westminster Abbey. In 1731 a magnificent monument, designed by Kent and sculptured by Rysbrack, was erected in the abbey at the expense of his relatives. It bears an appropriate inscription ending with 'Sibi gratulentur mortales tale tantumque exstitisse humani generis decus.'

In his person Newton was short, but well set, and inclined to corpulence. His hair, when he was old, was abundant, and white as silver. His eye was bright and penetrating till within the last twenty years of his life; but his countenance, though thoughtful, seldom excited much expectation in those to whom he was unknown. In his conversation there appears to have been little either very remarkable or agreeable; but we have the testimony of Dr. Pemberton that 'neither his age nor his universal reputation had rendered him stiff in opinion, or in any degree elated. Ascribing whatever he had accomplished to the effect of patient and continuous thought rather than to any peculiar genius with which nature had endowed him, he looked upon himself and his labours in a very different light from that in which both he and they were regarded by mankind. 'I know not,' he remarked, a short time before his death, 'what I may appear to the world; but to myself I seem to have been only like a boy playing on the sea-shore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me.' (Turner's 'Collections relative to the Town of Grantham.') But while he thus contrasted the littleness of human knowledge with the extent of human ignorance, he was fully conscious of the importance of his own labours, when compared with those of his predecessors and contemporaries, and evinced a natural readiness to assert and vindicate his rights whenever occasion might require. It were to be wished that, by an earlier publication of his discoveries, he had adopted the most eligible mode of establishing the undoubted priority of his claim. Such a course, by changing the current of events, would have left him less open to the charge of having disregarded the claims of others, or of having suffered their reputations to be prejudiced by his silent acquiescence in the acts of his colleagues. To judge of Newton from the life of him published by Sir David Brewster, we could only infer that his moral character had been tarnished by no one instance of human infirmity, and that every action had been dictated by feelings of benevolence and the love of truth. These were indeed the general motives by which he was actuated. The unrefuted disingenuousness of his behaviour towards Leibnitz, relative to the discovery of the calculus, and the yet more discreditable part which he took in the persecution of Flamsteed by the Royal Society, are exceptions. Sir David Brewster considers Leibnitz to have been the only aggressor, Newton the only sufferer. The MS. autobiography of Flamsteed was not discovered by Mr. Baily till the year following that in which Sir D. Brewster published his life of Newton. A life of Newton which explicitly attacks and professes to correct the manner in which his biographers have generally softened their accounts of the weaker parts of his character, written by Mr. De Morgan, will be found in Knight's 'British Worthies,' vol. xi. For a list of Newton's works, see the *Penny Cyclopædia.*

NEWTON, THOMAS, born 1704, died 1782, having been for the last twenty years of his life bishop of Bristol, and for the last fourteen dean of St. Paul's. He is chiefly known by two works: an edition of the 'Paradise Lost,' with notes, first published in 1749, and his 'Dissertation on the Prophecies,' of which the first volume appeared in 1755.

NEWTON, GILBERT STUART, R.A., was born in 1794, at Halifax, in Nova Scotia. He came to England about 1820, and entered as a student of the Royal Academy. His first works which attracted notice were the Forsaken, and the Lover's Quarrel. He painted the Prince of Spain's Visit to Catalina, for the Duke of Bedford, for 500 guineas. In 1830 he painted Shylock and Jessica, from the 'Merchant of Venice;' Yorick and the Grisette, from the 'Sentimental Journey;' and the Abbot Boniface, from the 'Monastery:' all in the exhibition of the Royal Academy in 1830. In 1831 and 1832 he exhi-

bited pictures each year in the Academy. In 1833 he was elected a Royal Academician, and exhibited a small picture of Abelard, which was his last, as he shortly afterwards became insane, and he died Aug. 5, 1835.

NEWTON-ABBOT. [DEVONSHIRE.]

NEWTON-IN-MACKERFIELD. [LANCASHIRE.]

NEWTOWN. [MONTGOMERYSHIRE.]

NEWTOWN-LIMAVADY. [LONDONDERRY.]

NEWTOWN-STEWART. [TYRONE.]

NEY, MICHAEL, Prince of the Moskowa, Duke of Elchingen, and Marshal of France, was born at Sárre-Louis in Lorraine, Jan. 10, 1769. He enlisted in 1787 in a regiment of hussars, became a lieutenant in 1793. and a captain the year following. He attracted the notice of General Kleber, and distinguished himself on various occasions throughout the war. At the peace of Luneville he went to Paris, where he was received with distinction by Bonaparte. In 1803 he was appointed minister plenipotentiary of the French Republic in Switzerland. On his return to Paris the command of a division of the army encamped near Boulogne was given him, and in 1804 he was raised to the dignity of a Marshal. On the renewal of hostilities with Germany in 1805 the direction of the eighth corps of the army was confided to Marshal Ney. A brilliant achievement in this campaign, the capture by storm of the village of Elchingen (Oct. 4, 1805), obtained for him the rank and title of Duke of Elchingen.

But it was during the Prussian campaign of 1806 that Ney's military reputation rose to its greatest height. In Sept. 1808, he was appointed to a command of the army in the Spanish peninsula, and he distinguished himself in the various engagements by which Gallicia and the Asturias were subjected. In Portugal, though under the orders of Marshal Masséna, the merit of the capture of Ciudad-Rodrigo (July 10, 1810) and of Almeida (Aug. 27, 1810) have generally been attributed to him. The different dispositions however of these two great generals soon brought on differences of opinion, which ended in a serious dispute, and Ney was recalled.

In 1812 he joined the disastrous expedition to Russia, and had the command of the third corps of the grand army. At the taking of Smolensko (Aug. 17, 1812), at the combat of Valentina (Aug. 19), and, above all, at the sanguinary battle of the Moskowa (Sept. 14), from which he derived his title of Prince of the Moskowa, he eminently proved himself worthy of the surname by which he was known to the army, of 'Bravest of the Brave.'

In the campaign of 1813 Ney displayed his usual courage and ability, and was instrumental in obtaining the victories of Bautzen, Lützen, and Dresden; but was himself defeated at Dannewitz (Sept. 6, 1813) by the Prussians and Swedes under Bernadotte. After the abdication of Napoleon, in 1814, Ney withdrew from public life and retired to his country seat. But on the return of Napoleon from Elba, although now pledged to the cause of the king and holding a high military command under him, an earnest appeal from his ancient chief completely overcame the loyalty of the marshal; and his defection was speedily followed by that of his whole army. After the defeat of Napoleon at Waterloo, in which battle Ney behaved with even more than his accustomed gallantry and skill, he returned to Paris, and remained there after the capitulation of that city to the allies. On July 24, 1815, however, he was placed on a list of proscribed persons. He endeavoured to leave France, but was arrested Aug. 5, at the château of Bessonis near Aurillac. He was tried by the Chamber of Peers, condemned to death, and shot on Dec. 7, 1815, in the garden of the Luxembourg. He met his fate in the most calm and courageous manner. During his trial his defence was rested on the 12th article of the capitulation of Paris; but this plea was rejected by the peers. Opinions are divided on this matter; but an unprejudiced judgment will now allow Ney the advantage of the plea. As to his treason, that was admitted by himself.

NIAGARA, River and Falls. [CANADA.]

NICÆA. [BITHYNIA.]

NICANDER, a physician, poet, and grammarian, of whose life very few particulars are known. It seems probable that he lived about 135 B.C., in the reign of Attalus III., the last king of Pergamus, to whom he dedicated one of his poems which is no longer extant, and that he was a native of Claros, a small town near Colophon, whence he is commonly called *Colophonius*. He appears to have been rather a voluminous writer, as the titles of more than twenty of his works have been preserved; but of all these we possess at present only two in a perfect state, with a few fragments of some of the others. The 'Theriaca' is a poem consisting of nearly 1000 lines in hexameter verse, on the wounds caused by different venomous animals, and the proper treatment of each.

The 'Alexipharmaca' is a rather shorter poem, written in the same metre, on poisons and their antidotes, and may be considered as a sort of continuation of the 'Theriaca.' The last and best edition of Nicander is Schneider's, who published the 'Alexipharmaca' in Greek and Latin, with the Scholia and copious notes, Halæ, 1792, 8vo. The 'Theriaca,' edited in the same manner, and containing also the fragments of Nicander's other poems, appeared in 8vo., Lips., 1816.

NICANDER, KARL AUGUST, a Swedish poet, was born at Stregnäs, on March 20, 1799, and educated at the university of Upsala. In 1820 he produced his 'Runesvärdet, eller den Förste Riddarn' (The Runic Sword, or the First Knight), a tragedy which manifested great power. His next production was entitled 'Runor' (the Runes), a series of sixteen legendary 'romaunts.' This appeared in a collection of poems by him in 1825-6; and in each of those years he obtained a prize medal from the Swedish academy, the latter of which was for his poem on the 'Death of Tasso.' Among his minor poems that on 'Florence' is of singular beauty and pathos. Nicander died February 7, 1839.

NICARAGUA. [CENTRAL AMERICA.]

NICCOLO DI PISA, or PISANO, a sculptor

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and architect who lived in the 13th century. In 1225 he was employed to execute the *arca* or tomb of San Domenico at Bologna, which he embellished with a series of bas-reliefs and figures truly admirable. He appears to have continued at Bologna till 1231, when he began the celebrated church of San Antonio, or Il Santo, at Padua, which acquired for him no less fame as an architect. Immediately afterwards, he was engaged to erect the church Dei Frari at Venice. Among the buildings which he executed at Florence, the most celebrated is the church and monastery of Santa Trinita. He begun the cathedral of Pistoja in 1240, and improved and embellished that at Volterra. At Arezzo, the convent of S. Domenico, at Viterbo, the church and convent of the Dominicans, where he did much in the way of repairs and restorations, and at Naples, the church of Lorenzo, besides the magnificent abbey on the plain of Tagliacozzo, testify to the repute in which his architectural talents were held and how extensively he was employed. Besides the Palazzo degli Anziani and S. Michele, among the edifices by him at Pisa the most noted is the campanile of S. Niccolo, or the Augustines. The representation of the Last Judgment and Inferno, in the façade of the Duomo of Orvieto, has been generally attributed to Niccolo, but is also asserted to have been the production of his son, Giovanni di Pisa, who may have been born somewhere about 1235, and whose chief work was the renowned Campo Santo, or cemetery at Pisa, with the adjacent cathedral, campanile, and baptistery. He executed several celebrated works at Siena, Naples, and elsewhere; and, loaded with honours and distinctions, died at Pisa in 1320, at a very advanced age.

NICE, or NIZZA, a division of the Sardinian States, bounded W. by France, from which it is separated by the Var, S. by the Mediterranean, E. by the division of Genoa, and N. by the main ridge of the Maritime Alps, which divide it from Piedmont, and send out numerous branches southwards, that cover about two-thirds of the whole territory. The Col-di-Tenda, the highest part of these mountains, rises about 5900 feet above the sea, and is crossed by the main road from Nizza to Turin. The mountain slopes and high valleys afford good pasture, and the loftiest uplands are covered with forests. The soil in the mountains is ill adapted for cultivation; but in the valleys and lower slopes of the south the soil is good and the vegetation luxuriant. Maize, barley, and a little wheat are the principal grain crops. Olives, figs, grapes, oranges, lemons, almonds, citrons, some dates, and various other fruits, are abundantly produced. The palm, the aloe, rose-laurel, myrtle, and other odoriferous and tropical plants flourish throughout the year; and it is not uncommon at the end of December to see some trees in blossom and others covered with fruit. The forests afford good timber. The mulberry is extensively cultivated. Cattle are numerous, and bees are carefully tended. The fisheries along the coast are very productive. There is an argentiferous lead mine near the town of Tenda. Spun silk, coarse woollens, soap, paper, and perfumes, are the chief industrial products. These articles, together with oil, raw silk, wine, honey, timber, and the fruits before-named, are the principal exports. The chief rivers are the Var (which receives the Vesubia and the Tinea), the Paglion, the Roja, the Taggia, and the Impero. Sheltered by the Alps from the north winds, the division has a delicious but rather a dry climate; the sea breezes moderate the heat of summer; in spring and autumn however the sirocco and the mistral are sometimes felt. A good road, affording a series of the most delightful and magnificent views, runs along the coast from Nizza to Genoa.

The division of Nizza lies between 43° 40′ and 44° 20′ N. lat., 6° 40′ and 8° 8′ E. long. Its length from N.E. to S.W. is about 75 miles; the mean breadth is about 23 miles. The area is 1623 square miles, and the population in 1840 was 232,347. The language of the people is a mixture of old Provençal French and Italian.

The division of Nizza, which consists of the former county of Nizza and the western portion of the old republic of Genoa, is now divided into 3 provinces, 28 *mandamenti*, and 194 *comuni*. The area and population of these provinces are as follows:—

Provinces.	Square Miles.	Mandamenti.	Pop. in 1840.
Nizza	1179	14	113,171
Oneglia . . .	174	6	57,865
San Remo . . .	265	8	61,311
Total . .	1623	28	232,347

The principal towns in *the province of Nizza*, are—*Nizza* [NICE]: *Sospello*, 17 miles N.E. from Nizza, population 4394: *Saorgio*, on the left bank of the Roja, population 2689: *Tenda*, at the foot of the Col-di-Tenda, population 2441: *Villa-franca*, a little east of Nizza, which has a good harbour, docks for the Sardinian navy, and a population of 2574: and *Briga*, 25 miles N.E. from Nizza, population, 3729. The province forms the see of the bishop of Nizza.

Of *the province of Oneglia*, situated between that of Albenga on the east and San Remo on the west, the chief town is *Oneglia*, which stands 45 miles E. from Nizza, on the sea-coast, at the mouth of the Impero, and has 5500 inhabitants. It has some fine churches, a college, and a small harbour, by which wine, fruits, and oil are exported. Oneglia is the birthplace of Andrea Doria. The other towns are—*Porto-Maurizio*, a well built busy little sea-faring town, with a population of 6481: and *Pieve*, N. by W. from Oneglia, in the valley of the Aroscia, population 3098. The province of Oneglia is included in the see of Albenga.

The *province of San-Remo*, situated W. of Oneglia, and E. of the province of Nizza and the principality of Monaco before described [MONACO], has for its chief town *San-Remo*, which is built on the slope of a hill rising from the sea-shore, 30 miles E. from Nizza, and has 9854 inhabitants. It is sheltered from the north winds by a semicircular group of mountains, the lower slopes of

which are planted with olive, lemon, orange, fig, almond, and pomegranate trees. The town, which is well built, has a handsome church, college, and a gallery of good paintings; it is supplied with water by an aqueduct of modern erection. The inhabitants trade with Marseille and Genoa in the produce of the country, and in dried fruit and salt provisions. The port of San-Remo admits small craft only. *Ventimiglia*, a well built town at the mouth of the Roja, a few miles W. of San-Remo, has 5894 inhabitants. It gives title to a bishop, whose see is the province of San-Remo. The cathedral and the church of San-Michele are handsome structures, said to be constructed with the remains and on the sites of two Roman temples. There are several Roman inscriptions in this town. *Taggia*, situated in a rich wine district on the right bank of the Taggia, 5 miles N.E. from San-Remo, has a population of 3880. *Triora*, 10 miles N. of San-Remo, is situated among the mountains on the left bank of the Taggia, and has 4846 inhabitants.

NICE or NIZZA, the ancient Νίκαια, founded by the Greeks of Massilia, now the capital of the Sardinian province and division of Nizza, is situated on the Mediterranean coast, about 10 miles eastwards from the mouth of the Var, 96 S. by W. from Turin, in 43° 41′ N. lat., 7° 16′ E. long., and has 35,195 inhabitants, including the garrison and foreign visitors. It is pleasantly situated, being bounded on the north by the Maritime Alps, and open on the south to the sea. The citadel of Mont-Albano, on a high and pointed rock, overhangs the town, and the Paglion, a mountain torrent, passes it on the west side, separating it from the suburb called La-Croix-de-Marbre. In this suburb the houses are painted externally in fresco, and surrounded with gardens containing orange and lemon trees. The town itself is divided into two parts, distinguished respectively as the old and new towns. The streets of the former are narrow; the latter is better laid out, and the houses are painted in fresco. There are two handsome squares, one of them surrounded with porticos. Adjacent to one of these is a raised terrace, which serves for a defence of the town against the sea and for a public walk. The ramparts of the town on the land side form another promenade. The cathedral of Santa-Reparata is the chief public building. The climate of Nice has been much celebrated for its mildness, but has been probably over-praised. The neighbourhood of the Alps, and the prevalence of the *Vent de Bise*, a keen searching wind, render the air frequently very cold and even frosty in winter and spring; and the heat in summer is excessive. It is however much resorted to by invalids and other strangers, especially English. The walks and rides in the neighbourhood of the town are agreeable. There are a theatre, baths, good inns, cafés, and a public library. The town has silk, cotton and paper mills, a great number of oil mills, and a tobacco manufactory. Soap, liqueurs, essences, superior turnery, inlaid tables, boxes, trays, and perfumery are also made. The port, which is protected by a mole, is spacious and secure. Vessels of 300 tons can enter it. The chief trade is in silk, oranges, fruit, and the manufactures of the town. The roadstead would afford anchorage to a hundred vessels of the line. The town gives title to a bishop, whose see is the province of Nizza. Foreign consuls reside in Nice. Steamers ply regularly between Marseille and Genoa.

NICE, COUNCIL OF. [Council.]

NICENE CREED, THE, is one of the three creeds received by the church of England. It consists of the creed drawn up by the first Council of Nicæa, with the addition of that part which relates to the divinity of the Holy Ghost. It was adopted in its present shape at the second general council of Constantinople, A.D. 381.

NICE'PHORUS I., emperor of Constantinople, was Logotheta, or intendant of the finances of the empire, under the empress Iréne and her son Constantine VI., in the latter part of the eighth century. Six years after Iréne had usurped the throne a conspiracy was formed against her, headed by Nicephorus, who was proclaimed emperor, 802. He banished Irene to the island of Lesbos, where she died in a state of destitution. The troops in Asia revolted against Nicephorus, and proclaimed the patrician Bardanes emperor, but Nicephorus defeated and seized Bardanes, confined him to a monastery, and deprived him of his sight. In this reign the caliph Harun al Raschid collected an army, which devastated Asia Minor, and destroyed the city of Heraclea on the coast of the Euxine. Nicephorus was obliged to sue for peace and pay tribute. In an attack which the emperor made on the Bulgarians he was utterly defeated by them and killed, July, 811. His son Stauracius succeeded him, but reigned only 6 months, and was succeeded by Michael Rhangabe, master of the palace.

NICEPHORUS II., descended of a noble Byzantine family, married Theophano, widow of Romanus II., and assumed the title of Augustus, 963. He repeatedly attacked the Saracens, and drove them out of Cilicia and part of Syria. He was murdered, 969, by Zimisces, an Armenian officer, who had an intrigue with his wife.

NICEPHORUS III., an old officer of the Byzantine army in Asia, revolted against the emperor Michael Ducas, A.D. 1078, and was proclaimed emperor at Constantinople. Another aspirant to the throne, Nicephorus Bryennius, was defeated, taken prisoner, and deprived of his sight. A fresh insurrection, led by Basilacius, was likewise put down by the troops of Nicephorus. Alexis Comnenus soon afterwards entered Constantinople by surprise, seized Nicephorus, and banished him to a monastery, where he died in a short time, A.D. 1081. [Alexis Comnenus.]

NICEPHORUS, patriarch of Constantinople in the year 806, warmly defended the worship of images against the Iconoclasts, and was consequently banished to a convent in Asia by the emperor Leo the Armenian, A.D. 816. He died in his retirement in 828. He wrote 'Chronographia Brevis,' being a short chronicle of events from the beginning of the world; 'Breviarium Historicum,' or historical abridgment from the end of Maurice's reign, A.D. 602, till the beginning of

the reign of Irene and her son Constantine, A.D. 780. Both the above works of Nicephorus form part of the collection of the 'Byzantine Historians.' He also wrote several other historical and theological works. He is numbered among the saints both of the Greek and Roman church.

NICERON, JEAN-PIERRE, was born at Paris in 1685. He entered the regular order of Barnabites, and devoted himself to the study of languages and biography. He died at Paris on the 8th of July 1738. He is chiefly known as the author—or in some parts rather the compiler—of 'Mémoires pour servir à l'Histoire des Hommes Illustres dans la République des Lettres,' of which thirty-nine volumes were published by Niceron, and four were added after his death. It is a laborious and useful work, though its critical merits are not great.

NICHE (from the Italian *nicchia*, signifying also a nook), a small recess, or concavity in the face of a wall for the purpose of containing a statue. The use of niches seems to have originated with the Romans, for scarcely anything of the kind occurs in the architecture of the Greeks. In Italian architecture niches are of very frequent occurrence. They are usually semicircular in plan, and round-headed, that is, covered by the quarter of a hollow sphere, owing to which the shadow within the concavity produces a highly beautiful curve. Niches exhibit great diversity in the modes of decorating them; but in this country it has usually been the fashion to leave them plain.

NICHOLAS, ST. [FLANDERS, EAST.]

NICHOLAS I., a deacon of Rome, was elected pope in 858. The allegiance paid by the Roman pontiffs to Charlemagne and his successors had greatly widened the breach between the Roman see and the Byzantines, and the schism of Photius, who had usurped the patriarchal see, completed the separation of the two churches. Nicholas excommunicated Photius. In the year 867, Basil, the Macedonian, having murdered the emperor Michael, succeeded him on the throne, and shortly afterwards restored Ignatius to the patriarchal see and banished Photius. Nicholas himself died at Rome in the same year, and was succeeded by Adrian II. Nicholas has left a number of letters upon questions of church doctrine and discipline, which are inserted in Coleti's 'Collection of Councils.'

NICHOLAS II. III. and IV. [POPE.]

NICHOLAS V., Tommaso da Sarzana, was elected pope after the death of Eugenius IV. in 1447. He soon after terminated the schism in the Western church by prevailing upon Felix V. in 1449 to abdicate in his favour. During the several years of tranquillity that followed, the pope, who was a patron of learning, collected books and MSS., and had translations made of the Greek classics, and of the fathers of the Eastern church; he received and patronised learned men from various countries, and especially from Greece: and he embellished Rome with sumptuous as well as useful buildings. He enlarged the university, restored the bridges as well as the aqueduct of the Acqua Vergine, and founded the Vatican library. Nicholas died in March, 1455.

NICHOLS, JOHN, born 1745, died 1826. When not quite 13, he was placed with Mr. Bowyer, the printer, to whose business he succeeded in 1777. In 1782 he published a quarto volume, entitled 'Biographical and Literary Anecdotes of William Bowyer, Printer, F.S.A., and many of his Learned Friends.' This work, many years afterwards, was recast and greatly enlarged, and published in 6 vols. 8vo., entitled 'Literary Anecdotes of the Eighteenth Century,' in 1812, to which two supplementary volumes were added, and they have been followed at intervals by five large octavo volumes more, with the new title, 'Illustrations of Literary History.' We regard this as the work on which Mr. Nichols's literary reputation will chiefly rest; and next to it may be placed his 'History of the County of Leicester.' In 1788 he published 'The Progresses and Processions of Queen Elizabeth,' and in 1797 'Illustrations of the Manners and Expenses of Ancient Times in England.' The entire number of works of which he was either author or editor amounted to 57. 'The Gentleman's Magazine' passed into the hands of Mr. Nichols in 1778, and continued under his direction till the time of his death. He greatly raised the reputation of the work.

NICI'AS, of Athens, the son of Nicomedes, and the pupil of Antidotus, was one of the most celebrated painters of antiquity. He was contemporary with Apelles. The most celebrated work of Nicias was Νεκυία, or the region of the shades, of Homer, from the passage of the Odyssey where Ulysses invokes the shades of the dead. Nicias painted in encaustic, and besides the one already mentioned Pliny notices the following pictures by him:—an Alexander (Paris), a sitting Calypso, an Io, an Andromeda, and another Calypso, in the hall of Pompeius; a Bacchus, a Diana, and a Hyacinthus, in the temple of Concord. The Hyacinthus was brought to Rome, and is mentioned by Pausanias (iii. 19), who says that the figure of Hyacinthus was very elegant.

Nicias painted some of the statues of Praxiteles, and seems to have been a painter of statues in his youth. The naked form was probably merely tinted and varnished, the colouring being applied only to the eyes, eyebrows, and lips, to the hair, the draperies, and the various ornaments of dress.

NICKEL. This metal was first described by Cronstedt in 1751. It is usually procured from the sulphuret. It has a white colour with a yellowish tint; its lustre is considerable, and it is both malleable and ductile. Like iron, it is attracted by the magnet, and may, like it, be rendered magnetic at common temperatures, but it loses this power when heated to 630° Fahrenheit. The specific gravity varies from 8.28 to 9.0. Nickel is nearly as hard as iron. It suffers little or no change by exposure to the air and moisture at common temperatures. It is very difficult of fusion, but melts at a lower temperature than iron. At a red heat it absorbs oxygen gradually from the air, and also decomposes water at this temperature. Nitric acid is the only acid which readily acts upon nickel. Nickel occurs in meteoric iron and aërolites.

The uses of nickel are very limited, and until

within a few years it was scarcely employed at all; but it is now very usefully employed, and to a considerable extent, in forming an alloy with copper and zinc, known by the name of German silver. Its oxides impart a green colour to glass and porcelain.

The ores of nickel are chiefly the *Sulphuret*, or Capillary Nickel; the *Arseniuret*, or Copper Nickel; the *Sulpho-Arseniuret*, or Gray Nickel; the *Silicate*, or Pimelite; and the *Arseniate*.

Oxygen and Nickel combine in two proportions, forming the protoxide and sesqui-oxide or peroxide. The *Protoxide* ($N^1 O^1$), is insoluble in water, readily dissolved by most acids, and yields green solutions. It is not reducible to the metallic state by heat alone, and is not attracted by the magnet. The *Peroxide* ($N^2 O^3$) is of a black colour, insoluble in dilute acids, potash, or soda.

Chloride of Nickel (N^1 Chl.^{1}), when deprived of water, has a yellow colour and a micaceous appearance; it is volatile, and may be sublimed at a high temperature.

The *fluoride*, *bromide*, and *iodide* of nickel are not much known, and are of little importance.

Sulphur and Nickel combine in two proportions, forming the sulphuret and disulphuret. The *Sulphuret* ($N^1 S^1$) is nearly black; the sulphuret procured in the dry way is of a grayish-yellow colour. The *Disulphuret* ($N^2 S^1$) is in colour lighter, and is more fusible than the sulphuret.

Phosphuret of Nickel is formed by the action of phosphorus upon nickel heated to redness; the resulting compound is whitish, brittle, and is decomposed when exposed to heat and air. It is more fusible than the metal.

There are also *Cyanide* and *Ferrocyanide of Nickel*.

Nickel forms alloys with arsenic, potassium, antimony, zinc, tin, iron, cobalt, mercury, and copper.

The salts of oxide of nickel are of course numerous, the chief being the *Nitrate*, *Sulphate*, and *Carbonate*. The peculiar properties of the salts of nickel are, that they are decomposed by the alkaline carbonates, and the precipitate is redissolved by ammonia, forming a beautiful blue solution, which is decomposed by potash and soda, but not by their carbonates.

NICOBAR ISLANDS are situated in the Indian Ocean, between 6° 50′ and 9° 20′ N. lat., and 92° 50′ and 94° 10′ E. long. They consist of nine larger islands and some smaller ones. The two most southern are called Great and Little Nicobar. Great Nicobar is more than twenty miles long, and eight miles across in the widest part. Little Nicobar is not half as large. The surface of these islands is hilly, and the hills in some places are rather high. They are in general covered with wood, and only a few tracts along the shores are cultivated. The soil is very fertile and capable of producing all the fruits and vegetables of intertropical countries. Ambergris and the edible bird-nest are the only articles of exportation. The inhabitants, of Malay origin, probably do not exceed 3000 or 4000. The Danes twice tried to form a settlement in the harbour of Noncowry, in 1756 and in 1768, but they abandoned it after a few years, on account of the unhealthiness of the climate. Some missionaries remained there till 1792, but as they did not succeed in the conversion of the natives, they returned to Tranquebar.

NICOLAI, CHRISTOPH FRIEDERICH, was born at Berlin, March 18, 1733, where his father was a bookseller. He was brought up to the business of his father, but pursued his studies in spite of every difficulty; and in 1755 he produced his 'Letters.' After the death of his father, he withdrew himself from business, but the unexpected death of his elder brother, in 1758, compelled him to carry on the business for the benefit of the family in general. In conjunction with Mendelssohn, he had already commenced (1757) the 'Bibliothek der Schönen Wissenschaften,' which was afterwards continued, till the end of 1805, under the title of the 'Neue Bibliothek,' &c. With Lessing and Mendelssohn he established, in 1759, the 'Briefe der Neuesten Litteratur;' and in 1765 projected the 'Allgemeine Deutsche Bibliothek,' of which periodical he continued to be editor till it reached its 107th volume. Among his other writings are his 'Anecdotes of Frederick the Great,' 1788; a 'Description of Berlin and Potsdam,' 3 vols., 1786; the 'Life and Opinions of Sebaldus Nothanker,' 1793; 'Life and Opinions of Sempronius Gundibert,' 1793; and many other minor productions. He died in 1811.

NICOLAITANES, a sect of heretics, who arose in the first century, and are mentioned with strong disapprobation in Rev. ii. 6, 15. It is generally supposed that 'the doctrine of the Nicolaitanes' (Rev. ii. 15) is the same as 'the doctrine of Balaam' (v. 14), namely, 'to eat things sacrificed to idols, and to commit fornication.' But this is a matter of dispute.

NICOLAO, SAN. [Cape Verds.]

NICOLAJEV. [Kherson.]

NICOLAS, SIR HARRIS, son of Captain Nicolas, R.N., was born March 10, 1799. He entered the navy in 1808; but retired before he had attained a higher rank than that of lieutenant. He then studied English antiquities and law. His first literary work, published in 1823, was his 'Life of Secretary Davison.' This was succeeded in 1824 by his 'Notitia Historica;' and in 1825, in which year he was called to the bar by the Society of the Inner Temple, by a curious and important 'Catalogue of the Heralds' Visitations.' His 'Testamenta Vetusta' appeared in 1826;' and in 1827 the four following works—'History of the Town and School of Rugby;' 'A Chronicle of London;' 'Memoir of Augustine Vincent, Windsor Herald,' and 'History of the Battle of Agincourt.' Passing by a large number of works of a similar class, which appeared year after year with astonishing rapidity, his Lives of Chaucer, Walton, and Cotton claim notice, as exhibiting vigilant research into several new channels of information. The 'Memoir of Sir Kenelm Digby' and the 'Autobiography of Lady Fanshawe' are agreeable contributions to our lighter literature; and the 'Chronology of History,' in Lardner's Cyclopædia, is an invaluable work of reference. His great works however are his 'History of the

Orders of Knighthood of the British Empire,' and his edition of 'Lord Nelson's Letters and Despatches.' Sir H. Nicolas died at Boulogne, Aug. 3, 1848. He was engaged until within a week of his death in editing the Papers of Sir Hudson Lowe. He has also left an unfinished 'History of the British Navy.'

NICOLAS-DU-PORT. [MEURTHE.]

NICOLAUS DAMASCENUS. [DAMASCENUS.]

NICOLAY, LUDWIG HEINRICH, FREIHERR VON, born at Strasbourg, Dec. 29, 1737, was one of the most pleasing among the minor poets of Germany. His 'Romantic Tales' have been greatly admired. Of his abilities, both as a didactic and satiric writer, proof is afforded by his 'Poetical Epistles.' Nicolay resided for the greater part of his life at St. Petersburg, whither he went in 1769 as preceptor to the grand-duke (afterwards emperor) Paul. He was made director of the Imperial Academy of Sciences in 1798; and in 1801 was raised to the rank of imperial privy-counsellor. He died in 1820.

NICOLE, PIERRE, one of the distinguished recluses of Port Royal, was born at Chartres on the 19th of October, 1625. At the age of 14 he was sent to study at Paris, where he was persuaded to join the community of the Port Royal, and he occupied himself in instructing the pupils confided to the institution. He formed an intimate acquaintance and a species of alliance with Anthony Arnauld. The angry disputes regarding the five points of the Jansenists prompted him to remain for several years a simple clerk, but in 1676 he was induced to seek holy orders. He was refused the necessary consent however of the Bishop of Chartres, who disliked his opinions. He was a man of simple habits and candid mind. He died on the 11th of November, 1695. He was the principal author of 'La Logique, ou l'Art de Penser' (1668), known as the Port Royal Logic. Of the first three volumes of 'La Perpétuité de la Foi de l'Eglise Catholique touchant l'Eucharistie,' which is generally associated with the name of Arnauld, he is known to have been the principal writer. Hume admired the logical clearness with which Nicole in this work showed the impossibility of one mind sufficiently examining all subjects connected with religion to form a creed for itself on the principle of private judgment; and stated that the difficulty so ingeniously set forth suggested to him the sceptical argument in his Dialogues on Natural Religion. He wrote also 'Traité de l'Unité de l'Eglise;' 'Les Prétendus-Réformés convaincus de Schisme;' 'Les Lettres Imaginaires et Visionnaires,' &c. He was eminent as a translator and composer in Latin.

NICO'MACHUS, a physician of Stagira in Macedonia, the father of Aristotle.

NICO'MACHUS, of Thebes, son and pupil of Aristodemus, was a Greek painter, who lived between 360 and 300 B.C. Pliny mentions by him—a Rape of Proserpine in the Temple of Minerva in the Capitol; a Victory in a quadriga, in the Capitol, which was dedicated by Plancus; also Apollo and Diana; a Cybele, the mother of the gods, sitting upon a Lion; Bacchantes, with Satyrs creeping up to them; and a Scylla, which was in the Temple of Peace. Nicomachus is the first who represented Ulysses with the pileus or cap of liberty.

NICOME'DES, the name of several kings of Bithynia.

Nicomedes I. succeeded his father Ziphœtes, B.C. 278. His succession was disputed by his brother Zibœtes; and he called in the Gauls to support his claims, B.C. 277. With their assistance he was successful; but his allies became his masters, and the whole of Asia Minor was for a long time overrun by these barbarians. He probably died about B.C. 250, and was succeeded by his eldest son Zielas.

Nicomedes II., surnamed Epíphanes, succeeded his father Prusias II., B.C. 149. He accompanied his father to Rome, B.C. 167. Prusias becoming jealous of the popularity of his son, and anxious to secure the succession to his younger children, formed a plan for his assassination; but Nicomedes, having gained intelligence of his purpose, deprived his father of the throne, and subsequently put him to death.

Nicomedes remained during the whole of his long reign a faithful ally, or rather obedient subject, of the Romans. During the latter part of his reign, he was involved in a war with Mithridates. [MITHRIDATES VI.]

Nicomedes III., surnamed Philópator, succeeded his father Nicomedes II., B.C. 91. At the breaking out of the Mithridatic war, B.C. 88, Nicomedes took part with the Romans, but his army was defeated by the generals of Mithridates, and he was obliged to take refuge in Italy. At the conclusion of the Mithridatic war, B.C. 84, Bithynia was restored to Nicomedes. He died B.C. 74, without children, and left his kingdom to the Romans.

NICOMEDI'A, a city of Bithynia, at the head of the gulf Astacénus in the Propontis, was founded by Nicomedes I., B.C. 264. Under the Roman emperors Nicomedia became one of the chief cities of the empire. It is now called Ismid, and is still a town of importance; but it contains few remains of antiquity.

NICOTIA'NA TABA'CUM, *Tobacco*, an annual plant, of which the leaves are used in a variety of ways, and also in medicine. The dried leaves are large, long, entire, smooth, somewhat glutinous, and of a brown colour, with a peculiar stupifying odour, and an acrid, nauseous, bitter taste. The processes of maceration and partial fermentation, and admixture of different substances render it more agreeable in the dried than in the fresh state. The analysis of tobacco shows its chief ingredients to be—1st, a tobacco-camphor, called nicotianin, which crystallises, and is solid at the ordinary temperature of the air; 2nd, nicotina an alkaloid, which, like conia, does not exist at ordinary temperatures in a solid form, but in a fluid and volatile state, having an oily appearance.

The empyreumatic oil of tobacco appears to be formed during the destructive combustion, and does not exist naturally in the leaf, but is probably formed at the expense of the nicotina. It does not therefore exist in the infusion of tobacco, the

mode of action of which differs in several respects from the other forms in which it is employed. The products of tobacco when burnt, as in smoking, are—carbonate of ammonia, nicotianin, empyreumatic oil, soot, and some gases.

Nicotina seems to be the formidable principle of tobacco when used in the solid form, or as an infusion; and the empyreumatic oil, when it is smoked, or when obtained by destructive distillation.

Tobacco is a very powerful agent, the active principles of which are extracted by water, either in the form of infusion or decoction. The local effects of tobacco-leaves, or any preparation of them, are those of an acrid substance; hence when taken internally they cause vomiting and purging, pain of the stomach and intestines, followed by inflammation and ulceration. The external application occasions irritation of the part, and, if kept long in contact with it, inflammation: snuffing the prepared powder induces sneezing and increased secretion of mucus; chewing or smoking it causes increased secretion of saliva, with diminished appetite in those unaccustomed to its use.

Tobacco must be considered as a narcotic acrid poison. Habit reconciles the system to its action when used moderately, but nothing can secure the body from its irritative property and its ultimate absorption when employed in excess.

NICOTIANIN, the principle which gives the characteristic odour to tobacco. It is a concrete oil having a smell of tobacco and a bitterish taste.

NICOTINA, an alkali which exists in the different species of tobacco. It crystallises in small plates, which, by exposure to the air, absorb moisture sufficient to become a transparent colourless liquid. When cold it is nearly inodorous, but when heated it has a disagreeable odour and taste. It boils at 375°; its specific gravity is 1.048. The salts which it forms with alkalis are colourless.

NIEBUHR, CARSTEN, a native of the duchy of Lauenburg, on the southern confines of Holstein, was born in 1733. He passed several years of his youth in the condition of a mere peasant. In his 21st year, some legal proceedings rendering it necessary to employ a land-surveyor in his native district, he resolved to qualify himself for the office, and applied zealously to the study of geometry. When he became of age he disposed of the wreck of his little patrimony, and employed a portion of it in acquiring higher instruction in the mathematics, first at Hamburg, and subsequently in the university of Göttingen. In his 24th year he entered the corps of Hanoverian engineers: but he was soon diverted from that service by an offer from the Danish government of employment in a scientific expedition to Arabia.

Niebuhr accompanied the expedition as a lieutenant of engineers, in the capacity of mathematician or geographer, to which the Danish minister, who had received some proofs of his disinterestedness in pecuniary affairs, added the responsible office of treasurer to the mission. Its other members were Frederic Christiern von Haven, as professor of the Oriental languages, Peter Forskäl as naturalist, Christiern Charles Cramer as physician, and George William Baurenfeind as painter or draughtsman.

The expedition sailed from Copenhagen, in January, 1761, in a frigate of the Danish royal navy, and arrived at Constantinople; from whence, after a short residence, the travellers proceeded in a merchant vessel to Alexandria, ascended the Nile, and reached Cairo in November, 1761. Having carefully explored the pyramids and other antiquities of Lower Egypt, they crossed the desert to Mount Sinai and Suez, embarked at that port in an Arab vessel, and landed at Loheia, in Arabia Felix, the destined seat of their mission, in December, 1762. They finally arrived at Mocha, where Von Haven died, in May, 1763. The surviving travellers proceeding from thence to Sana, the capital of Yemen, were favourably received by the Imaum; but they had meanwhile lost another of their number, the naturalist Forskäl, who died on the road. His companions returning to Mocha, there embarked in an English vessel for Bombay, on the voyage to which place the painter Baurenfeind expired; and at Bombay Niebuhr had the affliction to bury the last of his fellow-travellers, the physician Cramer. Sailing from Bombay, he visited Persia, including the ruins of Persépolis; ascended the Euphrates; proceeded by way of Bagdad and Aleppo to the Syrian coast; embarked for Cyprus; returned from that island to the continent; saw Jerusalem and Damascus; passed through Aleppo, and over Asia Minor to Constantinople; and finally returned to Copenhagen, in November, 1767. The cost of the travels of the mission, which occupied six years, and extended over so many countries, is said, by the good management and conscientious economy of Niebuhr, who indeed defrayed every expense that could be considered personal to himself out of his own narrow income, to have been to the Danish government only 4000*l*.

The Danish government undertook at its own charge the engraving of the plates of his travels, which were to be presented to him as a free gift; and he was left to publish the result of his labours at his own cost and for his own profit. Niebuhr first published his 'Description of Arabia,' in 1772. The research, the fidelity of delineation, and the accuracy of detail which it exhibits on the geography of Arabia, and the enduring character and condition of its inhabitants, have rendered this work of Niebuhr classical. This work was followed, in 1774–1778, by two volumes of equal merit and interest, narrating his 'Travels in Arabia and circumjacent Countries.' It was his intention to add a third volume, containing his inquiries into the state of the Mohammedan religion and Turkish empire, and his astronomical observations: but some causes, not sufficiently explained, delayed this publication, until a fire, which, in 1795, destroyed the king's palace at Copenhagen, and with it the original plates both of his published and inedited works, put an end to his design. The third volume was not published until 1837, and this publication was due to the liberality of the bookseller Perthes of Hamburg, and the affection of Niebuhr's family. His principal

works, which were published in German at Copenhagen, have been translated into French and Dutch, and reprinted at Amsterdam and Utrecht.

Niebuhr survived his return from his Oriental travels for nearly half a century. In 1778 he obtained a civil situation under the government at Meldorf in Holstein, to which he withdrew, and where he passed the long remainder of his existence. At the age of 72 years, notwithstanding the failure of his eyesight, he assisted in a new territorial survey ordered by the Danish government. He died in April, 1815.

NIEBUHR, BARTHOLD GEORGE, the son of Carsten Niebuhr, was born at Copenhagen, on the 27th August, 1776. He spent his infancy and boyhood at Meldorf, a town of Holstein, in great retirement. He derived great advantages from the society of Bojes, then well known in the literary world, who came to settle at Meldorf as landvogt in the year 1781. The wife of Bojes taught him French, his father instructed him in geography, in the English language, in the elements of mathematics, and in the Latin accidence. Bojes describes him as a juvenile prodigy in 1783, when Niebuhr was only seven years old. After having been at school from Easter, 1789, to Michaelmas, 1790, he became the private pupil of the headmaster, Dr. Jäger. He also received some advice with regard to the prosecution of his classical studies from J. H. Voss, who paid occasional visits to his father.

Carsten Niebuhr's wish was that his son should engage in some active business; but Barthold's tendencies were in favour of a studious life. It was accordingly resolved that after spending two years at Kiel, he should go to Göttingen, and study under Heyne. He studied at Kiel from Easter, 1794, to the spring of 1796.

In January, 1796, Count Schimmelmann, the Danish minister of finance, proposed to Niebuhr to become his private secretary; but his bashfulness and studious habits rendered him unhappy in this situation, and he soon exchanged it for that of supernumerary secretary to the Royal Library, which he entered upon in May, 1797, and held till April, 1798, when he paid a visit of two months to his family in Holstein, and then sailed for England. He resided in London and Edinburgh for about a year and a half, and returned to Holstein towards the end of 1799. About the middle of April, 1800, he went to Copenhagen, and obtained the appointment of Assessor in the College of Commerce for the East Indian department, and of secretary and accountant to the African consulate. The income arising from these appointments enabled him to marry Amalie Behrens in 1800, and he resided with her at Copenhagen till the year 1806. He did not however neglect his literary pursuits. An offer was made to Niebuhr, at the end of 1805, to enter into the service of the Prussian government, and he accepted the situation of joint-director of the first bank at Berlin.

He arrived at the Prussian capital on the 5th October, 1806, shortly before the battle of Jena. Upon the accession of Stein to the Prussian administration, Niebuhr was despatched to Amsterdam to negotiate a loan, and he resided there till April, 1809.

The opening of the university of Berlin, at Michaelmas, 1810, brought forward Niebuhr as a lecturer on Roman history; and the lectures which he delivered in this and the following year were published in 1811, and contain the germs of those new combinations and discoveries for which Niebuhr will be best known to posterity. The time which he spent at Berlin, from 1810 to 1813, seems to have been one of the happiest periods of his life.

Niebuhr's studious life was interrupted by the War of Liberation in 1813–14. He took an active part in these events. He was chiefly with the head-quarters of the allied army till February, 1814, when he was again sent to Holland on public business. He returned to Berlin in the October of that year, and resided there till the summer of 1816, when he proceeded as ambassador to the court of Rome. His wife died on the 20th June, 1815, shortly before he received his appointment as ambassador; and after a second marriage he started for Rome. The climate of Rome always disagreed with his wife, and when the business which had brought him to the papal court was finished, he wrote for his recall. In March, 1823, he went to Naples, to visit his friend De Serre, who was French ambassador in that city; and after staying there till the beginning of May, set out for Berlin. He afterwards retired to Bonn, where a university had been recently established, and where he gave lectures on Roman antiquities and various subjects. At the same time he availed himself of every opportunity of promoting and encouraging the labours of scholars. It was partly with this view that he set on foot the 'Rheinisches Museum,' and the new edition of the Byzantine historians was commenced under his direction. Early in 1827 he brought out the first volume of the new edition of his 'History of Rome.' The first edition appeared in 1811 at Berlin, in 2 vols. 8vo. The alterations in the second volume did not appear till the end of 1830. Niebuhr's sensitive mind was much affected by the Revolution which took place in Paris in the July of that year, and by the subsequent revolt of Belgium: he looked forward with the deepest anxiety to the probable consequences of those events. He died on the 2nd of January, 1831, leaving behind him several children.

It is difficult to conceive a more excellent and delightful person than Barthold Niebuhr appears to have been. His 'History of Rome' is perhaps the most original work that this age has produced. To understand what he has done in this work, we should keep in mind the state of knowledge on the subject before his time. The great object which he proposed to himself, in all his philological speculations, was to reproduce a true image of the past by getting rid of the deceitful influence of the present. Niebuhr was a man of great acquirements, as well as of original genius. In the words of one of his most ardent admirers, 'While his horizon was ever widening before him, it never sunk out of sight behind him: what he possessed

he always retained; what he once knew became a part of his mind, and the means and instrument of acquiring more knowledge; and he is one of the very few examples of men gifted with a memory so tenacious as to seem incapable of forgetting anything, who at the same time have had an intellect so vigorous as in no degree to be oppressed or enfeebled by the weight of their learning, but who, on the contrary, have kept it in orderly array, and made it minister continually to the plastic energy of thought.' ('Philol. Mus.,' i., p. 271.) This eulogy, though well merited, does not contain an exact estimate of Niebuhr's character as an historian. Many of his general remarks are founded on erroneous political opinions, or what are considered such by some of the best judges; and his mode of dealing with evidence, particularly when it was opposed to some theory that he had formed, is often arbitrary and unsatisfactory. But with all the drawbacks which the most rigorous criticism can exact, the feeling with which we contemplate his character and attainments is one of almost unmixed admiration. He was a rare combination of the man of business, the scholar, and the man of genius. If he had had no other claim to celebrity, he would have deserved to be mentioned among the general linguists whose attainments have from time to time astonished the world. His habits were those of a retired student, and his manners those of an unassuming domestic man.

A list of Niebuhr's philological works is given in the article *Niebuhr, B. G.*, in the *Penny Cyclopædia.*

NIEMCEWICZ, JULIAN URSYN, a modern Polish writer, who took an active part in the politics of his time, and was the attached friend of Koskiusko. His poetical works are rather numerous, and consist of six books of Fables; narratives, and miscellaneous pieces (among which are translations of Milton's 'Allegro' and 'Penseroso'); and 'Spiewy Historycne,' a series of thirty-three historical songs, wherein the poet-patriot chants the heroic deeds of his countrymen. Among his dramatic productions may be mentioned 'Wladyslaw,' 'Casimir the Great,' 'Jadwiga, Queen of Poland,' also a translation of Racine's 'Athalie.' His prose works consist of 'Oriental Tales;' a 'History of the Reign of Sigismund III.,' 3 vols., 1819; 'Memoirs relative to the earlier History of Poland,' 3 vols., 1822; 'Lejbe i Siora' (Levi and Sarah), 1825; and 'Jan y Teczyna' (John of Teczyn), an historical romance.

NIE'MEN is the Polish name of a river, which by the Germans is called *Memel,* and by the Lithuanians *Niemona.* It rises between 53° and 54° N. lat., and near 27° E. long., and flows past Grodno to Tilsit, forming part of the boundary between Russia and Prussia. About eight miles below Tilsit the river divides into two arms, which branch off respectively to the north-west and south-west. The northern arm, called Russ, divides again, about two miles from its mouth, into two arms, the Atmat and Skirwieck. The southern arm is called the Ghilghe. Both arms empty themselves into the Curisches-Haff. The delta included between the Russ and Ghilghe, called the island of Kaukehnen, is alluvial and of great fertility, but swampy. Though impeded by shoals at several places, the river is of great importance for the exportation of the produce of the adjacent countries. Canals have been formed to facilitate the transit. There is perhaps no other river in Europe whose floods rise to such a height and whose inundations are so destructive as those of the Niemen.

NIEUPORT. [FLANDERS, WEST.]

NIEUWELANDT, WILLEM VAN DEN, a Dutch author and artist, born at Antwerp in 1584, chiefly painted architectural compositions, which were eagerly sought after, and many of them engraved. His literary works consist of six tragedies, namely, 'Saul,' 'Claudius Domitius,' 'Nero,' 'Livia,' 'Cleopatra,' and 'Sophonisba;' all of which display talent. He also wrote a poem entitled 'Von den Mensch' (Man, or the Vanity of the World). He died at Amsterdam in 1635.

NIEUWLAND, PIETER, was born in 1764, at Diemermeer, where his father was a carpenter. At the age of seven he began to display a turn for making verses. Bernardus De Bosch, who was a lover of poetry, took the boy into his own house and placed him under the tuition of his brother, the celebrated Jeronimo De Bosch, by whom he was instructed in Greek and Latin. He was then sent to the Athenæum at Amsterdam, and afterwards to Leyden, and so distinguished himself, that in 1787 the post of head-master at the school of Utrecht was offered him. In the following year he increased his fame by the publication of some of his poetical pieces, including that entitled 'Orion.' In conjunction with Van Swinden he published a nautical almanac; and also wrote a treatise (1787) on the means of ascertaining the longitude at sea. In 1789 he was lecturer on navigation and natural philosophy at Amsterdam; in 1792, head teacher at Leyden, in the mathematical and physical sciences; and in 1793 professor of mathematics, physics, architecture, hydraulics, and astronomy. He died Nov. 14, 1794.

NIE'VRE, a department in France formed out of the old province of Nivernais, lies between 46° 40′ and 47° 35′ N. lat., 2° 50′ and 4° 10′ E. long., and is bounded N. by the department of Yonne, E. by Côte-d'Or and Saône-et-Loire, S. by Allier, and W. by Cher and Loiret. Its greatest length from N.W. to S.E. is 79 miles, from S.W. to N.E. 65 miles. The area is 2630 square miles, and the population in 1846 was 322,262, which gives 122.53 to the square mile, being 51.21 below the average per square mile for the whole of France.

The Morvan Hills lie along the eastern boundary, and send out towards the north-west numerous branches; one of which traverses the department from N.W. to S.E., and forms part of the watershed between the basin of the Loire and that of the Seine. The portion of the department belonging to the basin of the Seine consists of granitic hills furrowed by deep valleys; it is drained by the YONNE and its feeders, and has a general inclination towards the north. The larger portion of the department lies on the south-side of the watershed, and consists of extensive and sandy but

tolerably fertile plains, sloping down to the LOIRE, which crosses the south-western angle of the department, receiving the Aron and the Nièvre, a small stream that gives name to the department on the right bank, and the ALLIER on the left. The western boundary of the department is formed by the Allier and the Loire. The Allier, the Loire, and the Yonne are navigable; the two last are joined by the Canal-du-Nivernais, which leaves the Loire at Decize, runs up the valley of the Aron, and, crossing the watershed between the Loire and the Seine, enters the Yonne 3 miles S. of Corbigny. There are about 400 ponds in the department, most of which become dry in summer. The department is traversed by 9 royal and 12 departmental roads.

Though the soil of the department is in general poor, yet corn more than enough for the home consumption is raised by careful husbandry. The mountains supply abundant pasture, and a large number of cattle are reared. In the arrondissement of Château-Chinon, where the soil is decidedly bad, the only produce is rye, oats, or buckwheat. In the arrondissement of Clamecy, and in the districts that belong to the basin of the Loire, the produce includes wheat, wine, fruits, hemp, leguminous plants, &c. The hilly country is in many parts covered with extensive forests of oak, maple, and beech trees; timber forms one of the principal sources of wealth to the inhabitants, and is conveyed by water to Paris and other large towns. The quantity of wine produced in average years is about 6 millions of gallons, about one-third of which is exported chiefly from Pouilly-sur-Loire. The climate is temperate and healthy, but rather damp. Several iron mines are worked, and the ore is smelted and converted into malleable iron in a great number of iron-works, the most important of which are those of Pont-St.-Ours, Imphy, and Fourchambault. Coal mines are worked near Decize. The iron, coal and timber trades are important, and are continually improving in consequence of the great facilities for transit afforded by river and canal navigation. The manufactures are—woollen cloth, linen, hardware, inferior cutlery, fiddle strings, porcelain and pottery, paper, and glass. The chief articles of the commerce of the department are its agricultural and industrial products, hides, steel, copper, sheet iron, tin ware, oak-staves, wood charcoal, mill stones, vine-poles, cattle, fire-wood, &c. About 370 fairs are held in the year.

The department is divided into 4 arrondissements, which, with their subdivisions and population, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Nevers . . .	8	108	102,591
Château-Chinon . . .	5	55	68,087
Clamecy . .	6	97	78,172
Cosne . . .	6	66	73,412
Total . .	25	326	322,262

Of the arrondissement of Nevers, and of the whole department, the capital is NEVERS. *Decize*, a town of 3358 inhabitants, is built on a rocky island in the Loire at the junction of the Aron with that river, and at the head of the Nivernais canal. The only remarkable building is the old castle of the dukes of Nevers, which stands on the highest part of the island. The town communicates with both banks of the Loire by a good stone bridge and by a suspension bridge. Iron is manufactured and also tin; fuel-wood, charcoal, coal, oak-staves, vine-poles, hoops, &c., are the chief articles of trade. *St.-Pierre-le-Moutier*, a town of 2319 inhabitants, which owes its name and its origin to a suppressed Cluniac monastery, stands near a small lake 15 miles S. from Nevers. A kind of sand in request for the manufacture of porcelain is found at this place, and exported to Paris and Rouen. *Pougues*, famous for its mineral spring, is a small village of about 1200 inhabitants, a few miles N.N.W. of Nevers. *St.-Saulge*, situated N.E. of Nevers in a valley between two wooded hills, has a population of 2147.

In the arrondissement of Château-Chinon, the chief town *Château-Chinon* is situated near the source of the Yonne, 37 miles S. from Nevers, on a high hill surrounded by still loftier heights covered with forests; has a tribunal of first instance and 2900 inhabitants, who manufacture coarse woollens and leather, and trade in fuel-wood, charcoal, hides, wool, wheat, wine, and cattle. *Luzy*, on the Haleine, a feeder of the Aron, is situated in the south-east of the department, and has a population of 2273, and some trade in wood, charcoal, pigs, and cattle. *Moulins-Engilbert*, at the foot of the Morvan hills, a few miles S.W. from Château-Chinon, has an ecclesiastical school, and 2867 inhabitants, who manufacture coarse woollens, serge, linen, and leather.

In the arrondissement of Clamecy, the chief town *Clamecy* stands at the junction of the Beuvron with the Yonne, and has 5734 inhabitants, who manufacture woollen cloth, pottery and leather, and trade largely in wood and charcoal. The town was formerly fortified and defended by an old castle. From 1168 to 1793 it was the residence of a bishop, who took his title from Bethlehem in Palestine, the original see having been suppressed by the Saracens. Clamecy has tribunals of first instance and of commerce and a college. *Corbigny*, a town of 2124 inhabitants, situated in a well-wooded hilly country 11 miles S. by E. from Clamecy, and near the confluence of the Anguison with the Yonne, has cloth factories, tanyards, and a considerable trade in wood. *Lormes*, N.E. of Corbigny, formerly a fortified town defended by a strong castle still remaining, has a population of 3214. *Varzy*, 11 miles S.W. from Clamecy, is situated in a pretty valley at the foot of a high hill covered with vines and has a population of 3132, who manufacture linen, leather and pottery. In the neighbourhood there are several iron forges and furnaces. The town has a college, an hospital, and a town-house.

The arrondissement of Cosne takes its name from its chief town *Cosne* or *Cône*, the ancient *Condate*, which stands on the right bank of the

Loire, which is here crossed by a suspension bridge, 32 miles N. by W. from Nevers, and has a tribunal of first instance, a college, and 6308 inhabitants. The little river Nouhain, which here enters the Loire, drives the machinery of several ironworks and forges, in which anchors for the French navy are manufactured. The town is in general well built. It trades in corn, wine, nails, cutlery, timber, hemp, cattle, &c. *La-Charité*, 14 miles N. by W. from Nevers, prettily situated at the foot of vine-clad slopes on the right bank of the Loire, has a population of 5052, who manufacture cutlery, ironmongery, files, steel, bar iron, and metal buttons. There are iron forges, glassworks, and potteries in the neighbourhood. The town is clean, but on the whole an ill-built place. The bridge over the Loire is the most remarkable object. *Pouilly*, also situated on the banks of the Loire, a few miles below Cosne, in a rich wine district, has 3169 inhabitants. *Prémery*, N.E. of Nevers on the Nièvre, has iron forges and foundries, tile and brick works, and 2103 inhabitants. *Donzy*, E. of Cosne, on the Nohain, has a population of 3791, who manufacture bar and sheet iron, and trade in these products and in wood.

The department forms the see of the bishop of Nevers; is included in the jurisdiction of the High Court and University-Academy of Bourges; and belongs to the 15th Military Division, of which Bourges is head-quarters. Under the late monarchy it returned 4 members to the Chamber of Deputies; it now has 7 representatives in the Legislative Assembly of the Republic.

(*Dictionnaire de la France; Annuaire pour l'An* 1849.)

NIGELLA, a genus of plants belonging to the natural order *Ranunculaceæ*. The species are erect, annual, smoothish herbs. *N. sativa* has seeds which are angular, aromatic, subacid, and were formerly used instead of pepper; and have also been employed as carminatives. *N. arvensis* is native of middle and southern Europe in cornfields, also in the north of Africa. The seeds are sometimes used instead of those of *N. sativa*, but they are not so aromatic, neither have they so pleasant a smell. Both species are employed in the adulteration of pepper.

NIGER, or rather NIGIR, a name which has been given till lately to a large river mentioned by ancient as well as modern geographers as flowing through the interior of Libya or Central Africa. Herodotus (ii. 32), Strabo (p. 830), and Pliny ('Hist. Nat.,' v. 1), all speak of it; and throughout their confused notions of the hydrography of the interior of Africa, one constant report or tradition is apparent of the existence of a large river south of the great desert, and flowing towards the east. Ptolemæus, who wrote later than the preceding geographers, and seems to have had better information concerning the interior of Africa, enters at some length into the consideration of the rivers which flow from the mountains of Libya into the sea; and although his conclusions are now known to be incorrect, yet Colonel Leake has shown that they contain much more truth than the speculations of previous geographers.

The opinions established by the Arabian geographers of the middle ages, of the Niger flowing westward, led Europeans to look for its æstuary in the Senegal, Gambia, and Rio Grande; but upon examination of those rivers the mistake was ascertained; and D'Anville and other geographers separated the course of the Senegal from that of the Niger, and of the latter from that of the Nile. Mungo Park was the first European who saw the great internal river of Soudan flowing towards the east, and called Joliba. He traced it in two different journeys, from Bammakoo, about ten days from its source, to Boussa, where he was unfortunately killed in 1806. Clapperton crossed the river at Boussa, on his second journey to Sakkatoo in 1826; and after his death his faithful servant Richard Lander traced the river to its mouth; and the river thus traced is now believed to be the same as the great river of the Libya of Herodotus, the Nigris of Pliny, the Nigeir of Ptolemæus, and the Niger of modern geographers.

The Niger or Quorra rises in that extensive mountain-region which, under the name of the Kong Mountains, extends from the coast of Sierra Leone (13° W. long.) to the most eastern bend of the Quorra (7° E. long.). It is not yet known with certainty at what part of the range the source lies, nor which of the component streams is the principal; but the river above Timbuctoo is called by the natives the Joliba, and below that town, the Quorra: the name Niger being a general European name for the whole.

The Joliba has been visited by Mungo Park, Laing, Mollien, and Caillié. Near Timbuctoo, the barges which navigate the river are from 60 to 80 tons burden, and take the produce of the country, rice, millet, corn, honey, butter of the shea-tree, &c., to Timbuctoo and other large places. The crews consist of about 20 men; the boats use no sails. The lake of Debo, through which the Quorra flows, south of 16° N. lat., is of considerable extent; it is perhaps ten miles from south to north, but it occupies a much greater space from east to west. North of the lake, where the river flows to the north-east, cultivation is more general, and the number of villages is greater. Some of them carry on a considerable traffic with Timbuctoo. In approaching Timbuctoo the river separates into two branches, which appear to unite at no great distance farther down. The Quorra leaves the great plain of Soodán before it reaches the neighbourhood of Yáoorie. From that place to the mouth of the river the Quorra has been navigated by the Landers. Near Abbazacca (about 6° N. lat.) the river leaves the mountain-region, and enters a low alluvial plain, in which it divides into a great number of branches, which diverging to the east and west form a delta. It differs greatly from that of the Nile, its surface being mostly covered with swamps, and in other places with jungle. The river is frequently more than two miles wide, but in several places it contracts to a mile and even less, especially towards its mouth. The tide is perceptible to about 100 miles from its mouth.

The whole course of the river probably exceeds 2000 miles. We do not know that any of its

tributaries are of considerable size, except the Sharry or Tchadda, which joins it near 8° N. lat., and is not inferior in size to the principal river, though less deep.

In the year 1832, Mr. Macgregor Laird, and some other gentlemen of Liverpool, formed an association for the purpose of opening a direct communication with the interior of Africa by ascending the Quorra. In 1839 an expedition was planned by the government with a view of lessening the horrors of the slave trade by establishing commercial relations with the heart of Africa. These and later expeditions, though they have been unsuccessful as to their main object, have contributed to our knowledge of the countries along the banks of the Niger.

NIGER, CAIUS PESCE'NNIUS, appears to have been of humble origin; but his military talents recommended him successively to the notice of Marcus Aurelius, Commodus, and Pertinax, by whom he was employed in offices of trust and honour. He was consul together with Septimius Severus, and obtained the government of Syria.

On the accession of Didius Julianus, after the murder of Pertinax, A.D. 193, three generals, at the head of their respective legions, Septimius Sevérus, who commanded in Pannonia, Clodius Albinus, in Britain, and Pescennius Niger, in Syria, each claimed the empire. Niger was the most popular, and his cause was espoused by all the provinces of the East. But he did not possess the energy and activity of his rival Sevérus, who made himself emperor, and defeated Niger successively near Nicæa and at Issus. Niger fled towards the Euphrates, but was overtaken by a detachment of the enemy, and put to death.

NIGHT-JARS, or Goat-Suckers (*Caprimulgidæ*), a family of Fissirostral Birds, termed also Night-Swallows, Churn-Owls, Dor-Hawks, &c., of considerable numerical extent and wide geographical distribution, although two species only, one very rare, are European.

These singular birds are crepuscular and nocturnal in their habits; they pass the hours of day in repose, shrouding themselves from observation in the gloom of woods, or amidst the dense foliage of trees, coming forth at evening to feed upon such insects as, like themselves, are roused from inertion by the advance of darkness. They take their prey upon the wing, and perform during the chase the most elegant aërial evolutions. Their eyes are large, and of the true nocturnal character; the beak is sometimes small, sometimes inflated, but the gape is always enormous, extending below the eyes, and reminding us of the mouth of a toad; its margin is fringed with strong vibrissæ; the wings are long and pointed; the tarsi usually very short; the hind toe is, in some genera, united close to the base of the inner toe, and directed almost as equally forwards; the middle of the three anterior toes is the longest, and in the more typical forms is armed with a long claw, having a comb-like or pectinated inner margin.

The plumage is full and soft, and beautifully variegated, with dots, bars, dashes, and zigzag marks of mingled gray, brown, fawn-colour, black and white, difficult to describe, and almost as difficult to imitate. Rapid and abrupt as is the flight of these birds, still it is noiseless, resembling in that respect the flight of the owl, and from the same cause, viz. the laxity and want of rigidity in the quill-feathers; but from the form of the wing and tail the flight is of a different character.

Mr. Vigors regards the *Caprimulgidæ* as taking an intermediate place between the owls and swallows (*Hirundinidæ*). (Vigors on the 'Natural Affinities that connect the Orders and Families of Birds;' 'Linn. Trans.,' vol. xv.)

As examples of the present family we may mention the following species:—

The Common Goat-Sucker (*Caprimulgus Europæus*) is most probably the *αἰγοθήλης* (Ægothēles, or Goatsucker) of Aristotle and the Greeks, and the *Caprimulgus* of Pliny and the ancient Italians. The *Caprimulgus Europæus* is the *Calcabotto Piattaglione, Porta Quaglie, Boccaccio,* and *Cova-Terra* of the modern Italians; *Chotacabras* of the Spaniards; *Tette-Chèvre, Engoulevent Ordinaire,* and *Crapaud Volant* of the French; *Milchsauger Geissmilcher, Nacht Rabe, Nacht Schwalbe,* and *Tag-Schläfer* of the Germans; and *Goat-Sucker, Night-Jar, Jar-Owl, Churn-Owl, Fern-Owl, Dor-Hawk, Night-Hawk,* and *Wheel-Bird* of the British.

Goat-Sucker (*Caprimulgus Europæus*).

This species is migratory and nocturnal. The female lays two eggs on the bare ground. For a most interesting account of the habits of this singular bird, see White's 'Natural History o Selborne.'

The Rufous-Necked Goat-Sucker (*C. ruficollis*) This rare species occurs in Spain and South western Europe in summer. Its natural habita is most probably Northern Africa.

Of North American *Caprimulgidæ* we may allude to the Musqueto-Hawk of the Fur Countries (*Chordeiles Americanus*); the Whip-Poor-Will (*Antrostomus vociferus*); Chuck-Will's Widow (*A. Carolinensis*).

Turning to South America, we find in Paraguay and Brazil a singular fork-tailed Goat-Sucker (*Psa larus macropterus*), and among aberrant forms the *Proïthera diurna* (*Caprimulgus diurnus*).

The romantic caverns of Cumana are the haunt of the Guacharo-Bird (*Steatornis Caripensis*) which is a berry feeder. [GUACHARO-BIRD.]

As examples of African *Caprimulgidæ* we ma

adduce the African Long-Tailed Night-Jar (*Scotornis climaturus*). Locality, Senegal. The Pennon-Winged Night-Jar, or Long-Shafted Goat-Sucker (*Macrodipteryx* and *Africanus*). Locality, Sierra Leone.

Of the genus *Podargus*, in which the middle claw is not serrated, and of which the species are very numerous, we may instance the Wedge-Tailed Goat-Sucker of New Holland (*Podargus Stanleyanus*); the Cold-River Goat-Sucker (*P. humeralis*); the Long-Eared Podargus (*P. auritus*) of Australia and the islands of the Indian Archipelago; the Papuan Podargus (*P. Papuensis*); and the Javanese Podargus (*P. Javanicus*).

The *Podargi* are owl-like in their appearance. The bill is large and very strong, the tip and margins of the upper mandible folding over those of the lower; culmen elevated and arched; true rictal bristles none; tongue very thin and entire; tarsus short; inner edge of the middle claw dilated, but not pectinated. This genus is exclusively confined to Australia and the islands of the Indian Archipelago. Habits nocturnal, insectivorous. Plumage full, soft, and diversified with sombre tints. Eyes large; gape enormous. The genus *Podargus* is divided into a few subgenera, as *Batrachostomus*, *Ægotheles*, &c.

NIGHTINGALE, the English name for the most celebrated of the song birds of the Old World. This well-known species is the ἀηδών (Aëdon) of the ancient Greeks; *Luscinia* of the Romans; *Rossignuolo*, *Rusignuolo*, and *Usignuolo* of the Italians; *Rossignol* of the French; *Ruiseñor* of the Spanish; and *Nachtigall* of the Germans.

It is the *Luscinia* of Gesner, Aldrovandus, Willughby, Ray, and Brehm; *Motacilla Luscinia* of Linnæus; *Sylvia Luscinia* of Latham and others; *Curruca Luscinia* of Fleming; and *Philomela Luscinia* of Selby, Gould, and Swainson.

Nightingale (*Philomela Luscinia*).

The Nightingale, or Night Singer, is a migratory bird visiting us early in the spring (about the middle of April), and leaving us about August or September. The male birds arrive first, and are instantly sought after by the bird-catchers, who generally make the most of the interval of ten days or a fortnight that elapses before the arrival of the females, well knowing that those males which are taken after they have paired seldom survive. The bird-fanciers have a notion that a Surrey Nightingale possesses the finest quality of tone. To dwell upon the richness and variety of its song, a subject which has employed the pens of poets of all ages, and of all countries where the bird is known, would be superfluous.

M. Temminck states that the Nightingale haunts woods, thickets, and gardens; that it is common in nearly all the parts of Europe to Sweden inclusive; and that it migrates in winter into Egypt and Syria. Hasselquist saw it among the willows of Jordan and the olive-trees of Judeà. Mr. Strickland saw it at Smyrna on the 5th of April. The Prince of Musignano notes it ('Specchio Comparativo') as common in the neighbourhood of Rome, which it leaves in winter only. In his 'Geographical and Comparative List,' the Prince records it as found in Europe generally.

In our island the Nightingale is chiefly confined to the south-eastern counties. It is unknown in western Devonshire, Cornwall, North Wales, and the counties north of Doncaster in Yorkshire. It never visits Ireland, nor do any remain in Brittany or in the Channel Islands. In no part of Europe is it more common than in Spain or Italy; but even in these southern regions the bird is migratory — Africa being its temporary abode during the months of winter. The islands of the Greek Archipelago are among its favourite localities.

The Nightingale is recluse in its habits; its nest is placed low, and shrouded from observation; the eggs, five in number, are of an olive brown. The food consists of insects and their larvæ.

Besides this exquisite songster, there is another European species, viz. the Thrush Nightingale (*Philomela turdoïdes*, Blyth; *Luscinia major*, Brisson), which however is far inferior in vocal accomplishments to the true Nightingale, though its voice is loud. It is said to be common in Egypt.

NIGHTSHADE. [Atropa.]

NIGRIN, oxide of titanium, containing some iron. It occurs in Ceylon and in Transylvania.

NIGRITIA is a term which was formerly applied by geographers to that part of Africa which at present is known by the name of Soodán, of which Arabic expression it is only a translation, meaning the country of the blacks. [Soodan.]

NIKA. [Shrimps.]

NIKOSIA. [Cyprus.]

NILE (*Nilus*, in Latin), the name of the great river of Eastern Africa, the various branches of which have their rise in the high lands north of the equator, and, flowing through Abyssinia and other regions to the westward of it, meet in the country of Sennaar. The united stream flows northwards through Nubia and Egypt, and, after a course of more than two thousand miles from the farthest explored point of its principal branch, enters the Mediterranean by several mouths, which form the delta of Egypt. The three principal branches of the Nile are—the Bahr el Abiad, or White River, to the west, which is now ascertained to be the largest and longest: the Bahr el Azrek, or Blue River, in the centre; the Tacazze, or Atbara, which is the eastern branch.

These three branches were known to Ptolemæus, though in a very imperfect degree.

The Bahr el Abiad was traced upwards by Linant, in 1827, as far as Aleis. In 1840, 1841, and 1842, the pasha of Egypt sent three expeditions for the purpose of exploring the course of the river to its source, and the last two expeditions were accompanied by several scientific Europeans.

By these expeditions it has been ascertained that as far south as Aleis the Bahr-el-Abiad is in general from one to two miles wide, and runs in a bottom, which is generally four miles wide, but sometimes even six miles. Farther south the river is three miles wide, and contains a great number of low islands. Near 9° 11′ the Bahr-el-Abiad is joined from the east by a large tributary, the Sobat, which is supposed to rise in the mountains of Abyssinia, and brings down a volume of water nearly equal to that of the principal river. Above this point the Bahr-el-Abiad flows from west to east for about a hundred miles, and appears to traverse an immense swamp interspersed with many smaller and larger lakes, one of which is stated to cover an area of 420 square miles. The river is completely navigable, without cataracts and even without rapids. At length the expeditions arrived in the country of a black nation called the Barrys, where their progress was stopped by a ledge of gneiss, which traversed the river in all its width. The natives stated that the sources of the river were much farther south. Since 1842, further researches have been made on the White Nile, and the brothers Abbadie, in 1847, stated that they had ascertained its sources to be in 7° 40′ 50″ N. lat.

The Bahr el Azrek, or Blue River, which was long supposed to be the main branch of the Nile, has three sources in the high land of Gojam, near the village of Geesh, south-west of lake Dembea, in 10° 59′ N. lat. and 36° 55′ E. long., according to Bruce's observations. After a north and north-west course of about seventy miles, the Azrek enters the lake Dembea or Tzana on its south-western side. This fine lake is sixty-five miles length from south-east to north-west, according to Bruce's map, and above thirty in its greatest breadth; its surface is more than twice that of the lake of Geneva. It occupies the centre of an elevated table-land, surrounded by hills and mountain ranges, from which numerous streams fall into the lake. The Blue River, issuing from the lake at its south-east extremity, runs in a tortuous course, receiving the waters of the Toumet, Dandar, Rahat, and other rivers. At Khartûm the White and Blue rivers unite, the former being the wider. After passing Halfay the united stream of the Nile bends towards the north-east, passes by Shendy and the ruins of Meroe, and on entering the country of Berber it receives on its eastern bank the Tacazze or Atbara, the third great confluent of the Nile.

The Tacazze rises in the high mountains of Lasta, in about 11° 40′ N. lat., and 39° 40′ E. long. It flows for a considerable distance in a northern direction between the range of the Samen Mountains on the west, and those of Lasta, Salowa, and Bora on the east. It afterwards changes its direction very frequently, during which it receives the waters of the Arequa, Angrab, Mareb, and other streams. It is interrupted by many rapids; and at length enters the Nile at 17° 45′ N. lat., and about 34° 5′ E. long.

The Nile, from the confluence of the Tacazze down to its entrance into the Mediterranean, a distance of 1200 geographical miles measured along the course of the river, receives no permanent streams; but in the season of rains it receives wadys, or torrents, from the mountains which lie between it and the Red Sea. The breadth of the cultivable land on each bank through the Dongola country, which is above 100 miles in length, varies from one to three miles, beyond which is the desert. North of Argo, in 19° 40′ N. lat., the Nile enters the province of Dar Mahass, in Lower Nubia, where it forms a cataract, or rapid, commonly called the third cataract by those who ascend the river; near 22° N. lat. it forms the second cataract, called Wady Halfa; and at about 24° N. lat. forms the last cataract between granite rocks which cross the river near Assouan. Along this tract of Lower Nubia the valley of the Nile is very narrow. After entering the boundaries of Egyyt the Nile flows through the whole length of that country, which it waters and fertilises. [Egypt.]

NILGHERRY MOUNTAINS. [Hindustan.]

NIMA, a genus of plants belonging to the natural order *Simarubaceæ*. The species are trees, with alternate imparipinnate leaves, having four pairs of serrated leaflets. The flowers are disposed in panicle corymbs. *N. quassioides* is a native of Nepaul, in a valley near the town called Thankot. It is as bitter as the quassia of South America.

NIMEGUEN. [Gueldekland.]

NÎMES or NISMES, capital of the French department of Gard, stands at a short distance from the right bank of the Gard, in 43° 50½′ N. lat., 4° 20′ 46″ E. long., 29 miles N.E. by railway from Montpellier, and has 44,657 inhabitants. Nîmes, the ancient *Nemausus*, is a town of great antiquity. Strabo (p. 186. Casaub.) notices it as the capital of the Volcæ Ariscomisci. It submitted to Rome, B.C. 119, but retained its own laws and enjoyed the 'Jus Latii,' by virtue of which those elected to the ædileship or quæstorship in Nemausus acquired the rights of Roman citizens. It was fortified with walls and gates by the emperor Augustus, about 14 years before the Christian æra. On the downfall of the Roman empire Nîmes fell into the hands of the Visigoths; it was taken in the beginning of the 8th century by the Moors, from whom it was wrested by Charles Martel, at whose hands the town suffered much. In the religious wars of the 16th century it was one of the strongholds of the Calvinists: it submitted to Louis XIII., who dismantled the fortifications. In the earlier periods of the French revolution (A.D. 1791) and on the second restoration of the Bourbons (A.D. 1815) it was the scene of serious intestine troubles, political and religious.

Of all the towns in France, Nîmes preserves the most striking memorials of its ancient grandeur. The ancient temple, now called *Maison Carrée*, which is considered to be a master-piece of architecture, is the best preserved Roman monument in the city. Its ground plan is a rectangle 84 feet by 44; the interior length is 52½ feet; the breadth and height are 39⅓ feet each. It is surrounded by 30 fluted Corinthian columns, so arranged as to present 11 on each side, 6 in the front, and as many at the back: the columns at the angles being in this computation counted twice. The cornice and frieze which run all round the building, and the capitals of the columns, are regarded as models of architectural beauty. The only entrance to the building is by a door in the front under the portico, the ascent to which is by 15 stone steps. As there were originally no windows, it is conjectured that light was obtained by openings in the roof. There is reason to believe that this structure was only the sanctuary of a vast temple, the walls of which have been lately traced. The age of its erection is unknown, but from some traces of an inscription it is supposed to have been dedicated to Marcus Aurelius and Lucius Verus. In the middle ages it served as a town-hall: in the time of Louis XIV. the canons of St. Austin fitted it up as a church: it is now completely restored, and used as a museum of antiquities and a painting gallery.

The *amphitheatre*, which is near the Maison Carrée, is in form an ellipse, the major axis of which, extending from E. to W., is 431½ feet in length and the minor axis 337½ feet, including the thickness of the walls. The inclosing structure consists of a lower and an upper story, each pierced by sixty arcades; the whole is surmounted by an attic, the summit of which is 70⅓ feet high. The lower or ground story is adorned with pilasters, and the upper with Tuscan columns. The attic shows the holes destined to receive the posts on which was stretched the awning that covered the amphitheatre. The rows of seats were 24 in number. There were four principal entrances, one facing each cardinal point. The amphitheatre was capable of holding 24,000 spectators. It was built with great solidity without cement. The stones were quarried in the neighbourhood, and some of them are of immense size. The building stands isolated in the midst of a wide open space, and with the exception of the seats may be said to be in almost a perfect state. The arena is now used for bull-coursing, and for wrestling matches.

The edifice called *Temple de Diane*, but which was in reality an hydraulic edifice connected with the adjacent baths, is a mere ruin. The interior still exhibits some remains of a fine vaulted roof and of the niches and columns which once adorned it. The baths and the fountain which supplied them have disappeared, but their plan has been traced; a fountain erected under Louis XIV. disfigures the site. The waters of this fountain are conveyed by a canal round one of the public gardens of the town, and the place of the baths is occupied by statues and groups in marble, of modern date and inferior execution.

The *Tour-magne*, supposed to be a Græco-Celtic mausoleum and the oldest monument of antiquity in Nîmes, is a tower which originally consisted of several stories diminishing in circumference and differing in form as they rose from the lowest. The ruin now presents a lower story of heptagonal form, 321 feet in circumference, and an upper story, which is octagonal. The original height of the structure was 124 feet, but what now remains of it is only 78½ feet high. It stands on an elevation, and joined the ancient walls of the town.

There are two Roman gates. One of them, called Porte d'Auguste, was discovered in 1791, on pulling down some ramparts erected in the 12th century. This gate is built of large blocks of freestone, and has two large arches in the middle, and two smaller arches, one on each side. It bears an inscription, showing that the gates and walls were the gift of Augustus Cæsar to the colony.

Besides these remains Nîmes has a vast number of inscriptions, monumental and other, and one or two fine mosaic pavements. In the neighbourhood there is a Roman bridge.

Nîmes is situated in a delightful plain at the foot of hills covered with vineyards and olive-gardens. The city, properly so called, has narrow, crooked, and ill-built streets; it is surrounded by boulevards, which occupy the site of the ancient ramparts, and separate it from its suburbs, which at least equal it in extent, and have straight, wide streets, but the houses are ill built. Of the public edifices the most remarkable are the court-house, the former citadel which is now used as a central prison, the hospital, the theatre, the cathedral, and the college church. The cathedral contains some interesting monuments, among them the tomb of Fléchier.

Nîmes has long been an important manufacturing town. Its importance has been lately on the increase in consequence of its being the centre from which the railways diverge that connect the town with Alais, Montpellier, Cette, Arles, Avignon, and Marseille. The principal manufactures are fancy silk goods, silk stockings and caps, hosiery of all kinds, velvet, small wares, printed cottons, shawls, handkerchiefs, chintzes, &c. There are several dye-houses, potteries, brandy distilleries, vinegar-works, and tan-yards; and the town is the great market for the raw silks of the surrounding district. Nîmes carries on considerable trade in these productions; and in wine, spices, drugs, oleaginous seeds, medicinal plants, and dye stuffs.

Nîmes gives title to a bishop, whose see is the department of Gard. It has a High Court and University Academy, which have jurisdiction over the departments of Ardèche, Gard, Lozère, and Vaucluse; there are also tribunals of first instance and of commerce, a chamber of commerce, and an exchange, a council of Prud'Hommes, a theological college, a national college, a school of design, several cabinets of antiquities, and a public library of 30,000 volumes.

NINEVEH, called by the Greeks and Romans Ninus (Νῖνος), the capital of the Assyrian Empire, was situate in the plain of Aturia, on the Tigris. (Strabo, xvi. 737; Herodotus, i. 193; ii. 150; Ptolem., vi. 1.)

The Hebrew and Greek writers concur in describing Nineveh as a very large and populous city. Jonah speaks of it as 'an exceeding great city of three days' journey' (Jon. iii. 3). The walls of Nineveh are described by Diodórus as 100 feet high, and so broad that three chariots might be driven on them abreast. Upon the wall stood 1500 towers, each 200 feet in height, and the whole was so strong as to be deemed impregnable. (Diod., ii. 3; Nahum, chap. ii.)

According to the Greek writers, Ninus was founded by a king of the same name. It was the residence of the Assyrian kings, and is mentioned as a place of great commercial importance; whence Nahum speaks of its merchants as more than the stars of heaven (iii. 16).

On the dissolution of the great Assyrian monarchy, in the 8th century B.C., Nineveh was taken by the Medes under Arbaces, in consequence of the river demolishing part of the wall. But it appears to have still existed as the capital of an Assyrian kingdom till B.C. 625, when it was taken by the Medes under Cyáxares. (Herod. i. 106.) It is but very sparingly mentioned by later writers, and the history of its later fate is not known.

Until recently, there has been great uncertainty as to the actual site of Nineveh. Niebuhr and Rich pointed out mounds of ruins which they supposed to mark the site; but the recent researches of Layard and Botta have settled the point. M. Botta, French consul at Mosul, began his researches near that city in 1843. He commenced his operations in an inclosure on the river Tigris, which has long been conceived to be the ramparts of Nineveh, but which are now supposed to have contained only the palace of the Assyrian kings. He shortly however directed his attention to Khorsabad, a village distant about five hours north-east from Mosul. Here his discoveries of walls, bas-reliefs, inscriptions, and sculptures, were very considerable. He sent home to Paris a large collection of sculptures and inscriptions, and drawings of a still greater number, many of which have been since engraved and published.

A still greater addition to our knowledge of Nineveh has been made by Mr. Layard, who spent a large portion of time in the country, and who has shown the probable relation which the ruins at Khorsabad bore to those in other places on or near the banks of the Tigris. The results are exhibited in the minute details contained in the two volumes of his narrative, in the splendid folio volume of plates published in 1849, and in the sculptures now deposited in the British Museum.

NINOVE. [FLANDERS, EAST.]

NINTH, an interval in music, of which there are two kinds; the major 9th, composed of six tones and two semitones; and the minor 9th, composed of five tones and three semitones.

NIO, IOS, one of the Cyclades, situated 5 miles S. by W. of Naxos, is about 9 miles in length and 5 in its greatest breadth. The surface is hilly. The chief produce is corn, which is of good quality, but the island is deficient in fruit and other trees. The population is about 2200. The town, called also *Nio*, is built on a hill on the western coast, above a bay in which there is good anchorage and a fine spring of water issuing out close to the shore. On the eastern coast is another good harbour, called Manganuri. The pilots of Nio are reckoned among the best in the Archipelago. [ARCHIPELAGO, GRECIAN.]

NIONS, or NYONS. [DROME.]

NIORT, the capital of the French department of Deux-Sèvres, situated on the Sèvre-Niortaise, in 46° 19′ N. lat., 0° 28′ W. long., at a distance of 225 miles S.W. from Paris, and has 18,739 inhabitants. The town is situated in a delightful and well cultivated district, and is built on the slopes of two hills, and on both sides of the river. It was formerly one of the most wretched looking towns of the department, but it has been considerably improved of late years. The town-hall is a very ancient building, once the palace of Eleanor of Guienne, wife of Henry II. of England; there are two churches, one of them an ancient gothic building with a fine spire raised by the English; cavalry barracks; and an ancient castle, which is now used as a prison. The town has two good squares, and there is a pleasant promenade near the barracks. The chief manufactures are chamois and other leather, gloves, shoes, woollen and cotton yarn, druggets and other woollens, saddles, braces, horn combs, paper, saltpetre, and confection of angelica. Considerable trade is carried on in wine, staves, timber, corn, flour, wool, and hair. The navigation of the river Sèvre commences at Niort. There are in the town tribunals of first instance and of commerce, a council of Prud'Hommes, a college, two hospitals; a theatre; a public library of 20,000 volumes; and a botanic garden.

NIPON. [JAPAN.]

NISCHNEI-NOVGOROD, that is, Lower Novgorod, or Nischegorod, a government of Great Russia, is situated between 54° and 57° N. lat., and 41° 45′ and 46° 15′ E. long. It is bounded N. by Kostroma, N.E. by Wiätka, E. by Casan, S.E. by Simbirsk, S. by Perm, S.W. by Tambow, and W. by Wladimir. The area is 20,180 square miles, and it is divided into eleven circles.

The population is about 1,500,000. The inhabitants consist chiefly of Russians, Tschuvasches, Mordwins, Tscheremesses, and some Tatars. The Greek church predominates, and is under the bishop of Nischnei-Novgorod.

The country is an undulating plain, diversified only by the high lands along the banks of the rivers and by small elevations. The soil consists in a great measure of sand, with a mixture of good earth, and in many places it is covered with a thick layer of black mould; here and there clay is found, with portions of iron or ochre. The principal river is the Wolga, which enters the government from Kostroma, and flows thence to Casan in a semicircular bend. This great river in its course through the government, receives the Oka, Kulma, Kirsenez, Sura, Werlugo, and Alatyr.

Nischnei-Novgorod is one of the most fertile and productive provinces of the empire. The in

habitants grow rye, buck-wheat, millet, peas, beans, large quantities of flax and hemp, and abundance of vegetables. The forests are very productive. The breeding of cattle, though subservient to agriculture, is very carefully attended to. Most of the villages are full of artisans and little manufactures of all descriptions, who, without belonging to a manufactory, yet make a great abundance and variety of articles. The exports are varied and extensive.

The chief city, *Nischnei-Novgorod*, is in 50° 20′ N. lat. and 44° 28′ 36″ E. long., at the confluence of the Oka and the Wolga. It consists of three parts. 1. The fortress, at the top of a hill, which is 5665 feet in circumference, is surrounded with a wall which has five square and two round towers, several of which are in a state of decay, and two gates. In this fortress are the two cathedrals dedicated to St. Michael and to the Transfiguration, the palaces of the governors, and some other public buildings, and an obelisk of granite 46 feet high. 2. The city itself is situated on the declivity of the hill on the Wolga, which is pretty well built in the Russian fashion: the streets indeed are narrow, but there is a large open market-place and a fine quay. 3. The suburb, which twenty years ago consisted entirely of wooden houses, has been since much improved.

This city is the residence of the military governors of Perm and Nischnei-Novgorod, of the civil governor of the latter, the see of the bishop, and the seat of the various public offices. The public buildings and institutions are, 42 churches, of which 30 are of stone, 3 convents, a bazaar, and 2200 booths or stalls of wood. The population is about 27,000. The inhabitants carry on various manufactures; but the great and annually increasing importance of Nischnei-Novgorod arises from its fair. This fair, which is opened on June 29 in each year, is one of the greatest in the world. It is held in a group of buildings, formed into a large oblong parallelogram, surrounded with shops, before an edifice adorned with three rows of columns, which is the hotel of the governor, in which the local authorities reside during the fair. Forty-eight blocks of buildings, separated by streets which intersect each other at right angles, extend behind this parallelogram. The number of the shops is about 2524, and over each there is a small apartment, in which the merchant may reside. During the fair, all the streets and warehouses are filled with a countless multitude, who have flocked thither from the two Russian capitals, from various other towns of Russia, from the shores of the Baltic and the Caspian, from Bokhara, Khiva, Kokand, and Taschkend, from Asia Minor, from the mountains of Turkistan and the frontiers of China, and, of late years, from different parts of Western Europe. All these magazines and booths are filled with the produce of the most diverse countries, and thousands of boats are employed in landing the goods, or in taking them on board to convey them to the seas which wash the northern and southern shores of the empire. Other goods, such as wooden wares, are piled up even in the open country, and farther on are long lines of carts with their horses, which serve both as magazines, and lodgings for the country-people. From 4000 to 5000 warehouses and booths are let during the fair. The goods sold are said to exceed 20,000,000*l.* sterling.

The other principal towns in this government are—*Arsamas*, 8500 inhabitants, with manufactures of silk, leather, silver, iron, and soap, and considerable trade in linen, sail-cloth, and shoes; *Podschinski*, 5500 inhabitants, with an imperial stud; *Pawleno-Selo* on the Oka, 6600 inhabitants; *Liskowa* on the Wolga, 4300 inhabitants; *Muraschkina*, 7000 inhabitants; and several other thriving towns.

NISI PRIUS. [Assize.]

NISIBIS. [Mesopotamia.]

NISMES. [Nîmes.]

NISSO'LIA, a genus of plants belonging to the natural order *Leguminosæ*. *N. ferruginea* is native of Guiana, and exudes from its stem a red transparent gum that has a powerful astringent flavour. It is also known by the name of *N. quiriata*. None of the species of this genus are European, nor are they of any known use.

NITH; NITHSDALE. [Dumfriesshire.]

NITHARD, born A.D. 790, was son of Angilbertus, and of Bertha, daughter of Charlemagne. He wrote in Latin a history of the wars between Charles the Bald and his brothers, which is inserted in Duchesne's collection 'Historiæ Francorum Scriptores.'

NITELLA, a genus of plants belonging to the natural order *Characeæ*. Four species of this genus have been described inhabiting Great Britain. *N. translucens* is the largest of the British species, and best adapted for the examination of the curious currents of sap which are to be seen in the whole of the family to which it belongs. *N. flexilis* is not unfrequent in lakes and still waters. The stem, like that of Chara, is often incrusted with carbonate of lime. *N. nidifica* is a native of the salt-water ditches in the south and east of England. *N. gracilis* is a small, delicate and elegant species, but probably not distinct from *N. flexilis*. In fact, it may be questioned whether all these species are not varieties of one.

NITRATES. [Nitric Acid.]

NITRE. [Potassium.]

NITRIC ACID was formerly called Spirit of Nitre, or Glauber's Spirit of Nitre; and when much diluted with water, it is called Aquafortis.

Nitric Acid, when pure, is a colourless liquid, but is usually yellowish. Its smell is strong and disagreeable, and it emits white fumes. It is so acrid that it cannot be safely tasted without being much diluted, and is even then very sour. In its concentrated state it stains the skin of a yellow colour, and eventually the skin is destroyed and peels off.

The density of the strongest acid is 1.5; when mixed with water it gives out considerable heat; it acts strongly on vegetable blue colours, and decomposes alkaline and metallic carbonates with effervescence if previously diluted. When colourless nitric acid is exposed to the action of the light, it undergoes partial decomposition;

and, owing to the formation of nitrous acid, it is rendered either pale or deep orange, according to the length of time it is exposed to the sun's rays.

Nitric acid consists of O^5 N^1; but the strongest acid yet obtained contains $1\frac{1}{2}$ equivalent of water.

Nitric acid is used for numerous purposes; such as the refining of gold and silver, in preparing various metallic and saline solutions for medicinal purposes, and the use of the dyer and calico-printer; in scientific chemical researches it is most extensively employed. Its saline compounds are termed *Nitrates*.

NITRIC ACID, *Medical Properties of*. This acid in a concentrated form acts as a violent corrosive poison, and is therefore never used in an undiluted state for internal administration, but it is sometimes applied externally, when the object is to effect the speedy destruction of any part. Nitric acid however, from its frequent employment in the arts, is often the cause of accidental poisoning, and it surpasses all the other mineral acids in the rapidity of its action. The most appropriate antidotes are such substances as combine with and neutralize the acid, such as chalk or magnesia, made into a paste with water.

In an undiluted form, nitric acid is a most valuable application to sloughing phagedenic ulcers; also for destroying warts, or causing vesication over the stomach in Asiatic cholera, or for dropping into a carious tooth to relieve toothache. For all other purposes it is very largely diluted.

In its action on the system it differs from other acids, inasmuch as it does not produce the cooling and thirst-allaying effect which they do, but on the contrary causes a feeling of warmth in the stomach, with thirst and increase of appetite. It is often given as a tonic, but for many purposes for which it is recommended it may be doubted if it be good.

NITRIC OXIDE, the *Nitrous Air* of Priestley, since also termed *Deutoxide of Azote*, *Deutoxide* or *Binoxide of Nitrogen*, &c. It is colourless, and probably tasteless and inodorous; but when an attempt is made to inhale it, it excites violent spasm of the glottis by meeting and combining with the oxygen of the air, which converts it into nitrous acid gas, a very different compound. Its specific gravity is about 1.040; 100 cubic inches weighing rather more than 32 grains. Water at 60° dissolves about 11 per cent. It supports combustion in some cases. It is probably decomposed when passed through red-hot tubes; and the same effect is produced by a succession of electric sparks. It is also decomposed when exposed to zinc or iron, which take away half the oxygen, and convert it into *Nitrous Oxide*. It consists of O^2 N^1, or, by volume O^1 N^1.

NITROBENZIDE is liquid, has a light yellow colour, a very sweet taste, and a peculiar odour, intermediate between that of oil of cinnamon and of bitter almonds. Its specific gravity is about 1.209; it boils at 415°, and condenses without having suffered any alteration; it becomes solid and assumes the form of acicular crystals at about 38°. It consists of O, C, N, and H.

NITROGEN, or AZOTE, has also been known by the names of *mephitic air* and *phlogisticated air*. It may be procured in many ways; but, however obtained, it is transparent, colourless, inodorous, and insipid. It is lighter than atmospheric air, which being reckoned 1, the specific gravity of nitrogen is about 0.97. Its refractive power and its specific heat are both lower than those of common air. Water dissolves but a very small quantity of this gas. It is fatal to animals when respired by itself, as is implied by the term *azote;* it extinguishes flame immediately; no degree of cold and pressure to which this gas has been subjected has condensed it to a fluid form.

Nitrogen resembles all other elementary bodies in being destitute of acid or alkaline powers; its affinity for substances, both elementary and compound, appears to be extremely weak, there being no one with which it combines by mere mixture, or by the action of heat under common circumstances. It enters into the composition of a great number of important compounds. Thus it constitutes from $\frac{79}{100}$ to $\frac{80}{100}$ of the volume of atmospheric air: this however may be regarded rather as a mixture than as a chemical compound of oxygen gas and azotic gas; but with oxygen it forms five definite compounds, viz. nitrous oxide, nitric oxide, nitrous acid, hyponitrous acid, and nitric acid. With hydrogen it constitutes the alkali ammonia; with chlorine and iodine it gives rise to detonating compounds; with carbon it forms cyanogen; and with phosphorus a phosphuret. It enters into the composition of most animal matter except fat and bone; and, though not a constituent of the vegetable acids, it forms a part of most of the vegetable alkalies. Although by itself fatal to animals, yet it is a most important constituent of the air, as serving to moderate the action of oxygen during combustion, and the too great excitement which that gas, respired unmixed, would produce on the animal system. It appears also from the experiments of Majendie that animals will not live on food that contains no azote.

Although nitrogen has not been decomposed it is strongly suspected to be a compound body. Its atomic number is 14.17.

NITROHEMATIC ACID has the form of small brown crystalline grains, and scarcely any taste. When exposed to a moderate heat, it begins to liquefy, and afterwards detonates without the evolution of light. With bases it forms peculiar salts, the solutions of which are of a deep blood-red colour.

NITROLEUCIC ACID appears in the form of white slender crystals, having a sour taste. With bases it forms peculiar salts, of which only two have been described, namely the nitroleucate of lime and of magnesia.

NITROMURIATIC ACID. [CHLORINE.]

NITRONAPHTHALASE has the form of a square prism terminated by acute pyramids; its colour is sulphur yellow; it melts at about 110°. It may be sublimed without decomposition, and the vapour, on condensing, crystallises. It is neutral, and insoluble in water, but alcohol and æther readily dissolve it. It consists of C^{20}, H, O^4, N^1.

NITRONAPHTHALESE has the form of minute acicular crystals. It is insoluble in water, slightly soluble in æther, but readily so in alcohol; it becomes liquid at 365°. It consists of C^{20}, H^6 O^3, N^2.

NITROPICRATES. [Carbazotic Acid.]

NITROSACCHARIC ACID has the form of rather flat prisms, which are colourless, transparent, and striated. It is very soluble in water, but insoluble in alcohol, even when boiling. When it is heated, it swells, decomposes, and yields a penetrating vapour. It forms peculiar salts, which detonate vividly when they are heated.

NITROSULPHURIC ACID. This name has been applied to a mixture of nitric and sulphuric acid, first proposed by Mr. Keir as a solvent for silver. It dissolves silver at a temperature below 200°, while it scarcely acts upon copper, lead, or iron, until diluted with water. On account of these properties this mixed acid has been found useful in separating silver from old plated articles. It consists of S^1, O^6, N^2.

NITROUS ACID may be prepared either in a gaseous or fluid form. The gas, which is reddish, becomes liquid at a temperature of 0° Fahr.

Liquid nitrous acid, when cool, is pale, but becomes darker when heated; it emits a very strong disagreeable odour, and at a very moderate rise of temperature it reassumes the gaseous form. Its specific gravity is 1.451. It is decomposed by water with strong effervescence. It consists of O^4, N^1. The gas is composed of one volume of nitrogen, and two volumes of oxygen, condensed into one volume. Its specific gravity is to that of air about as 3.19 to 1, and 100 cubic inches weigh nearly 99 grains.

NITROUS OXIDE GAS, called by Priestley *Dephlogisticated Nitrous Air*, is colourless and transparent; its smell is peculiar but rather agreeable, and its taste is sweet: 100 cubic inches weigh about 47 grains, and its specific gravity is to that of air therefore about as 1.5 to 1. It supports combustion, and a taper, ignited phosphorus, sulphur, and charcoal burn vividly in it. At a red heat it is resolved into its constituent gases in the proportions of O^1 N^1.

This gas was supposed to be irrespirable, until the contrary was proved by Davy, in his 'Researches on Nitrous Oxide.' To that work we must refer for an account of the very exhilarating effects which this gas produces when respired.

NIVELLES. [Brabant, South.]

NIVERNAIS, one of the provinces into which France was divided before the Revolution, is now comprehended in the department of Nie'vre.

NIZAM, the title of the sovereign of Hydrabad, derived from Nizam-ul-Mulk, who, after the death of Aurungzebe, obtained possession of the Mohammedan conquests in the Deccan, his name being assumed as a title by his successors in the sovereignty.

The province of Hydrabad lies between 15° and 22° N. lat., and 75° and 82° E. long. It is bounded N. by Candeish and the Ceded Districts on the Nerbudda; E. by the Raja of Berar's dominions and the Northern Circars; S. by Guntoor and districts ceded by the Raja of Mysore; and E. by the Southern Mahratta Country, Bejapoor, and Aurungabad. Its greatest length N. to S. is 420 miles, and its greatest breadth 360 miles. The area is about 95,000 square miles. The population is estimated at about 9,000,000. [Hindustan.]

NIZZA. [Nice.]

NOBILITY. [Baron, Barony; Peers.]

NOCE'RA, NUCERIA, a town of ancient Umbria, now belonging to that province of the Papal State called 'Delegazione di Perugia.' It is built on a steep hill on the western side of the central ridge of the Apennines, near the source of the river Topino, which is an affluent of the Tiber. Nocera lies on the high road from Rome to Pesaro and Rimini. Nuceria was a city of the Umbri, and is mentioned by Livy (ix. 38) as having surrendered to the Romans, with other towns of Umbria, in 307 B.C. In the fall of the Western Empire, Nuceria was repeatedly devastated by the Visigoths and other northern tribes. Under the Longobards it formed part of the duchy of Spoleto. In the year 1198 Innocent III. annexed it to the Papal territories. It is a bishop's see and has 2600 inhabitants. The surrounding territory, which is hilly, produces wine, oil, and plenty of fruit.

NO'CTHORA, M. F. Cuvier's name for the *Douroucouli*, a quadrumanous animal of South America, with several characters that remind the observer of some of the *Lemuridæ* (the Loris especially) of the ancient continent and its islands.

Humboldt, who first gave a detailed and clear account of this curious form, sees in it, and with good reason, an approximation to the Slow Lemur or *Lori paresseux* of the French (*Lemur tardigradus* of the south of Asia), and the physiognomy and features, particularly the eyes, well justify the comparison. So far it would seem to represent in America the *Lemuridæ* of the Old World; but the teeth are the same with those of the Sajous (*Simiæ apella, capucina*, &c., Linn.), according to M. F. Cuvier, who observes, that if the canines were small in the individual examined by him, that was because it was a female.

The organs of motion do not present anything very particular. The four extremities or hands are formed exactly like those of the Sajous, except that the animal does not extend the fingers of the fore-hands, which remain raised as M. F. Cuvier has represented them. The nails are long, narrow, channelled, and a little hooked; the tail is very moveable, but not prehensile, though the animal can turn it over its back, or round its neck or its legs. The pupil of the eye is round, and the eyes themselves are very large, and without any accessory organ.

Habits, entirely nocturnal and arboreal. The Douroucouli, *N. trivirgata*, spends the day in sleep, folded up with the head hidden between the fore-legs; but as soon as the brightness fades into twilight the animal awakes to activity. The eyes, which, if exposed to the full brilliancy of day, are darkened with excess of light, for the iris is then closed completely, perform their office as the shades of night approach, and the pupil then dilates nearly to the size of the eye.

Humboldt informs us that, in a state of nature, the Douroucouli hunts small birds, and also, especially, insects. It eats all sorts of vegetables, but is particularly fond of bananas, sugar-cane, the fruit of the palms, the nuts of the *Bertholettia*, and the seeds of the *Mimosa Inga*. They do not live in societies, but pass their time together in pairs. Their nocturnal cry resembles that of the Jaguar. Its voice is of extraordinary power and volume when considered in relation to its size. Its throat swells when it is irritated, and the animal then resembles in its dilatation and posture a cat attacked by a dog. More than one species are ascertained. Locality, Guiana, Brazil.

NODAL POINTS AND LINES. The former are those points in the length of a string extended between two fixed objects, or in a column of air confined at one or at each extremity, which, when the string or column is put in a state of vibration, are found to remain at rest; and the latter are corresponding lines which exist on the surface of an elastic body, usually a plate, whose parts are in a state of vibration.

Galileo was the first who observed ('Dialoghi delle Scienze Nuove') that the vibrations of elastic plates might be rendered visible by covering the plates with fine sand; and he remarked that the sand became accumulated at the parts where the vibrating plate was in a state of rest: but this subject was extensively investigated by Dr. Chladni of Würtemberg, who first discovered the longitudinal vibrations of solid bodies; and, in 1787, published, in a work intitled 'Entdeckungen über die Theorie des Klanges,' an account of numerous experiments which he had made on the nature of the vibrations produced in plates of glass of different forms.

NODE. The points of a planet's or comet's orbit in which it cuts the ecliptic, and the points in which the orbit of a satellite cuts that of its primary, are called the nodes of such planet, comet, or satellite.

NODIER, CHARLES, was born at Besançon in France, April 29, 1780. He adopted literature as a profession at a very early age, published a vast number of works in various branches, was a regular contributor to the 'Journal des Debats,' and editor of the 'Quotidienne,' two Parisian newspapers. His principal works are the poem of 'Napoleone;' 'Le Dictionnaire des Onomatopées,' a dictionary of words deriving their signification directly from the action they represent; 'Examen Critique de la Langue Française;' 'Le Peintre de Salzbourg,' a novel; and several other novels in imitation of the German school. Nodier was appointed librarian to the Arsenal at Paris about 1822, and elected a member of the French Academy in 1834. He died Jan. 7, 1844.

NOGENT. [Aube; Eure-et-Loir.]

NOIRMOUTIER. [Vende'e.]

NOJA. [Bari, Terra di.]

NOLA. [Lavoro, Terra di.]

NOLA'NA, a genus of plants belonging to the natural order *Solanaceæ* and the tribe *Nolaneæ*. *N. prostrata*, Prostrate Nolana, is a native of Peru, but grows freely in this country in the open air. The species of *Nolana* are only valuable as ornamental plants; they are showy when in blossom, and are much like some of the trailing species of *Convolvulus*.

NOLLE PROSEQUI is a phrase used in proceedings at common law to denote the voluntary withdrawal of the plaintiff or other originating party in a judicial proceeding from the further prosecution of his suit, and is derived from the words used in the formal entry of such withdrawal on the record, in which the party 'acknowledges that he will not further prosecute' (fatetur se ulterius *nolle prosequi*). The effect of a 'nolle prosequi in criminal cases is to discharge the defendant for the time, but it does not operate as an acquittal.

NOLLEKENS, JOSEPH, was born in Dean Street, Soho, London, Aug. 11, 1737. At the age of thirteen he was placed with Scheemakers, the sculptor, and while with him obtained some prizes from the Society of Arts, who afterwards voted him fifty guineas for his Timoclea before Alexander. He set out for Rome in 1760, where he turned his attention also to manufacturing antiques, by vamping up fragments, finding either heads and limbs for bodies, or bodies for heads and limbs. His dexterity and skill in repairs of this kind were subsequently displayed in some of the Townley Marbles. He established himself on his return to London in Mortimer Street, became an associate of the Royal Academy, and was shortly afterwards honoured by the king sitting to him for his bust. Notwithstanding numerous commissions for monuments (some of which are in Westminster Abbey) and busts, Nollekens found time to undertake several statues and pieces of poetic sculpture, among which were no fewer than five Venuses, one of them since known by the name of the Rockingham Venus, and one representing the goddess anointing her hair, which last was reckoned by the artist himself to be his master-piece. Among his groups were a Pætus and Arria, and a Cupid and Psyche. He died April 23, 1823.

NOLLET, JEAN ANTOINE, a distinguished French philosopher, was born at Pimpré, in the Noyonnais, in 1700. He was sent to the college of Beauvais, in order that he might prosecute the study of theology; but, his taste inclining him to cultivate the physical sciences, the intention was abandoned, and he was never otherwise connected with the church than by holding deacon's orders with the title of Abbé.

The Abbé Nollet applied himself particularly, in conjunction with M. Dufay, to the subject of electricity; and he soon became distinguished by the number as well as the ingenuity of his experiments with relation to that science. In 1734 he made a visit to England, when he was elected a Fellow of the Royal Society of London: he went from hence to Holland for the purpose of conversing with the philosophers of that country; and, on his return to Paris, he delivered a course of lectures on physics, which was well attended. In 1739 he was elected a member of the Académie des Sciences: and, during the same year, he went to Turin, where he repeated his electrical experiments in presence of the Duke of Savoy. In 175

the King of France founded a chair of experimental philosophy at the college of Navarre, and he appointed the Abbé Nollet to superintend it. The zeal and ability with which Nollet fulfilled the duties of his post gave full satisfaction to the king, who conferred on him the title of Master of Philosophy and Natural History to the Royal Family. Nollet was subsequently appointed Professor of Experimental Philosophy to the School for Artillery, which then existed at La Fère, and which was afterwards removed to Mézières. He died April 24, 1770.

His principal works are 'Leçons de Physique Experimentale,' in 6 vols. 12mo., 1743; 'Recherches sur les Causes particulières des Phénomènes électrique,' in 12mo., 1749; and 'Essai sur l'Electricité des Corps,' 12mo., 1750.

NOMINALISTS, a sect of the scholastic philosophers, so named on account of the particular tenet by which they were distinguished, and in opposition to the Realists, another scholastic sect. According to Plato, universals, or, as he called them, ideas, by which are to be understood such things as we express by general terms, have, apart from the mere conception of them by the understanding, an actual and eternal existence in the Divine Mind; and are the patterns or models according to which the individuals of every species are formed, and by which the constitution of each individual is determined. The separate existence of these essences was denied by Aristotle, who taught that forms—which word as employed by him has the same meaning with the ideas of Plato—were eternally united to matter; that unconnected with it they have no existence, and that they are inherent in their objects. The doctrine of Aristotle was universally received among the schoolmen until after the commencement of the 11th century. But with the revival of dialectic science, which about this time occurred, it began to be warmly controverted. Those who adopted the Stoical doctrine, and affirmed that words or names only were universal, were termed Nominalists; while those who adopted the Peripatetic opinion, and maintained the proper existence of universals, were termed Realists. Roscelin, canon of Compiègne, is said to have been the first who raised the sect of Nominalists into distinction. The Nominalist doctrine was obnoxious to most of the divines as well as the philosophers of the period, chiefly perhaps, as Brucker supposes, on account of Roscelin having employed it in illustrating the mysterious constitution of the Divine Nature, and thereby laid himself open to the charge of heresy. Notwithstanding the opposition which it encountered, many converts were made; and its advancement was greatly promoted by the genius and learning of Abelard, who was one of the disciples of Roscelin. Throughout the whole of the 12th century the contest between the rival sects continued to be waged. At this period the Realists, both in number and respectability, had the advantage of their opponents, and the erudition and subtlety of Albert the Great, Thomas Aquinas, and afterwards of Duns Scotus, gave them such a decided predominance as to throw the Nominalists into the shade. In the 14th century William Occam, an English Franciscan friar, and a pupil of Scotus, becoming the advocate of Nominalism when it was seemingly about to expire, effected a revival, and brought it into greater repute than it had ever before enjoyed. The Reformation, to which a long train of causes had been conducting, put an end to the controversy so long and so fiercely carried on between the two most memorable parties that have ever arisen among the schoolmen; and the contemporaneous revival of letters eventually gave the death-blow to the scholastic philosophy.

NOMINATIVE. [Declension.]

NOMSZ, JAN, a Dutch poet, born at Amsterdam in 1738, acquired some distinction by his epic or rather historical poem of 'William I., or the Foundation of the Freedom of the Netherlands,' in twenty-four books, 1779. As a dramatic writer, Nomsz showed greater talent, especially in his tragedies 'Cora,' 'Zoroaster,' the 'Duchess of Coralli,' and 'Maria van Lalain.' He died in St. Peter's almshouse at Amsterdam, in 1803.

NONACOURT. [Eure.]

NONAGESIMAL. The nonagesimal degree of the ecliptic is that point of the ecliptic which is highest above the horizon. Every point of the ecliptic is therefore the nonagesimal degree in succession.

NONATE'LLIA, a genus of plants belonging to the natural order *Rubiaceæ*. *N. officinalis*, Asthma Bush, is a native of Guiana, in forests and sterile places. All the parts of this plant, when bruised or dried, give out a slight aromatic odour. There are several other species of *Nonatellia*, all natives of America, but none are used in the arts or as medicines.

NONCONFORMITY is the term employed to designate Protestant dissent from the Church of England. The English Reformed Church first received a definite constitution in the reign of Edward VI., and from the reign of Elizabeth downward penalties were imposed on or disabilities created by a want of conformity to the ritual of the Established Church. The Act of Uniformity (1 Eliz. c. 2) forbade, under severe penalties, the performance of divine worship except as prescribed in the Book of Common Prayer. By s. 14 a penalty of 12*d.*, to be levied by the churchwardens, was imposed on persons who did not frequent the parish church. This penalty of 12*d.* is repealed, but only so far as dissenters are concerned. The act 23 Eliz. c. 1, s. 5, provided that 'every person above the age of fifteen who shall not repair to some church, chapel, or usual place of common prayer, but forbear the same, contrary to 1 Eliz. c. 2, shall forfeit 20*l.* a month; and if any such person forebore to attend church for twelve months, he was to be bound with two sureties in 200*l.* at least, and so to continue bound until he conformed. In ss. 6 and 7 of this statute it is enacted that 'if any person or persons, body politic or corporate, shall keep and maintain any schoolmaster which shall not repair to church as is aforesaid, or be allowed by the bishop or ordinary of the diocese, they shall forfeit 10*l.* a month;' and it was further provided that 'such schoolmaster or teacher presuming to teach

contrary to this act shall be disabled to be a teacher of youth and be imprisoned for a year.' By another statute (29 Eliz. c. 6, ss. 4, 6), it was enacted that persons who had been once convicted of not attending divine service contrary to 23 Eliz. c. 1, were, for every month afterwards until they conformed, to pay into the Exchequer, without any other indictment or conviction, in every Easter and Michaelmas term, as much as should then remain unpaid at the rate of 20*l.* a month; and in default of payment, the queen might, by process out of the Exchequer, seize all the goods and two-thirds of the lands of such offenders. By 3 Jac. I. c. 4, s. 11, the king might refuse the payment of 20*l.* a month, and take two parts of the offender's land at his option. Towards the close of Elizabeth's reign the offence of Nonconformity and its further progress was attempted to be stopped by another statute (35 Eliz. c. 1), which provided (s. 1) that any person above the age of sixteen who obstinately refused to attend divine service might be committed to prison. By 3 Jac. I. c. 4, s. 32, a penalty of 10*l.* a month was imposed on any person who maintained, relieved, kept, or harboured in his house any servant, sojourner, or stranger, who, without reasonable excuse, forbore to attend the church for a month together. By 21 Jac. I. c. 4, s. 5, it was enacted that actions against persons for not frequenting the church and hearing divine service might be laid in any county at the pleasure of the informer.

Charles I. adopted towards the Nonconformists the policy of his predecessors. In carrying into execution his designs against Puritanism, he found an able and zealous assistant in Archbishop Laud, under whose arbitrary administration the proceedings of the Star Chamber and High Commission Court were characterised by great severity. Many Puritans sought for safety and quiet in emigration; and the colony of Massachusetts Bay was founded by them in North America. But a proclamation by the king put a stop to this self-banishment; and thus even the miserable consolation of expatriation was denied. But a change was approaching. In 1644 Laud was declared guilty of high treason and beheaded; and about five years after, Charles shared the same fate. The parliament abolished Episcopacy and everything in the church that was opposed to the model of the Genevan church.

The Restoration, in 1660, placed Charles II. on the throne of his ancestors, and led to the restitution of the old system of church government and worship. Many acts were passed to promote conformity. Among them was the Five-Mile Act (17 Car. II. c. 2), which banished the Nonconformist clergy to that distance from every corporate town where they had formerly preached, and forbade them to officiate as schoolmasters except on condition of their taking the oath of passive obedience. The Corporation Act (13 Car. II. s. 2, c. 1), though directed against the Roman Catholics, pressed with equal severity against Protestant dissenters, and excluded from offices in municipal corporations those who refused to receive the eucharist according to the rubric of the Church of England. This was followed by the Test Act (25 Car. II. c. 2.)

In the reign of William III. the Toleration Act (1 Wm. III. c. 18) gave immunity to all Protestant dissenters, except those who denied the Trinity, from the penal laws to which they had been subjected.

The benefits conferred by the Toleration Act were subsequently much abridged by the Occasional Communion Bill, which excluded from civil offices those Nonconformists who, by communion at the altars of the Church, were by the provisions of the Test Act qualified to hold them; and by the Schism Bill (repealed by 19 Geo. III. c. 24), which restricted the work of education to certificated churchmen. By the repeal of the Corporation and Test Acts in 1828 (9 Geo. IV. c. 17) [Established Church], and by the passing of the acts relating to registration and marriage, dissenters have been allowed the peaceable enjoyment of their religion.

By the act 52 Geo. III. c. 155, it is provided that any congregation of Protestants amounting to twenty shall be registered in the Diocesan's court and at the quarter-sessions of the peace, under a penalty not exceeding 20*l.* nor less than 20*s.* Nonconformist places of worship may be registered for the solemnization of marriages on application to the register-general by certificate, which must be signed by twenty householders who have used such place of worship for one year. (6 & 7 Wm. IV. c. 85, s. 18.)

It would be a task of some difficulty to enumerate the various sects which may be classed under the general head of Nonconformists. The chief denominations are the Presbyterians, Independents, Baptists, Wesleyan and Calvinistic Methodists, and Quakers. Most of the minor sects of dissenters may be considered as only subdivisions of or included in the above denominations.

NONES. [Kalendar.]

NO'NIUS MARCELLUS, a Roman grammarian, was born at Tibur, in the fourth century. He was the author of a small work entitled 'Compendiosa Doctrina de Proprietate Sermonum,' which is chiefly valuable for the quotations which it contains from old Latin writers. This work has been edited by Mercer, Paris, 1614, which edition has been republished at Leipzig, in 1826.

NONNUS (sometimes called Nonus), a Greek physician, who wrote a medical work still extant entitled 'Compendium totius Artis Medicæ,' by command of the emperor Constantinus Porphyrogennetus, most probably the seventh of that name. His real name is supposed by Freind ('Hist. of Physic'), Sprengel ('Hist. de la Médecine') and Bernard ('Præfat. ad Theoph. Non.') to be Theophanes. There are only two editions of this work which is principally a compilation from other writers. The last and best is in two vols. 8vo. Gotha and Amsterdam, 1794, 1795, Gr. and Lat.

NONNUS, an inhabitant of Panopolis, in Egypt, lived at the beginning of the 5th century of the Christian æra. He became a Christian at a very advanced age. He was the author of two works in Greek, which have come down to us, the 'Dionysiaca' and a Paraphrase, in verse, of the Gospel of St. John. The best edition of the

'Dionysiaca' is that by Graefe, 2 vols. 8vo., Leip. 1819–1826. A French translation of the 'Dionysiaca' was published at Paris in 1625. The 'Paraphrase of St. John,' which is a poor performance, and has been roughly treated by Heinsius, in his 'Aristarchus Sacer,' Leyden, 1627, was published for the first time at Venice, in 1501. The best edition of it is by Passow, Leip. 1834.

NON-RESIDENCE. [BENEFICE.]

NONSUIT. [JUDGMENT.]

NONTRON. [DORDOGNE.]

NONTRONITE — *Silicate of Iron.* This mineral occurs in small nodules, greenish yellow, and opaque. It consists chiefly of silica, peroxide of iron, and water.

NOODT, GERARD, born at Nimeguen in 1647, studied first in his native town, and afterwards at Leyden, Utrecht, and Franeker, where he took his degree in law. He was distinguished as a jurist, and was made professor of law successively at Franeker, Utrecht, and at Leyden. He studied and taught jurisprudence in an enlightened and philosophical spirit. He was well acquainted with the Roman Jurists, as well as with the other Roman writers, especially the historians, upon whose model he formed his own Latin style, which is remarkably pure. Noodt died at Leyden in 1725. He ranks among the most distinguished jurists of modern times. His works have been collected and published in 2 vols. fol., Leyden, 1735, with a biography of the author by Barbeyrac.

NOOTKA SOUND is a large bay on the western shores of the island of Quadra and Vancouver, which is on the north-west coast of North America, lying between 49° 30′ and 49° 40′ N. lat., 127° and 128° W. long. Vancouver Island has been lately (1849) granted by the British government to the Hudson's Bay Company.

NORBA. [BARI, TERRA DI.]

NORD, a department in France, thus named from its being the most northern division of that country, lies between 49° 58′ and 51° 5′ N. lat., 2° 7′ and 4° 23′ E. long., and is bounded E. by Belgium, S. by the department of Aisne, W. by those of Somme and Pas-de-Calais, and N. by the North Sea. It is formed out of the old province of French Flanders, of nearly the whole of Hainaut Français and Cambresis, and of small portions of Artois and Vermandois. Its length from Dunkerque to the S. of Trélon, is about 124 miles; its breadth is very variable, being 39 miles at the widest part, but not quite 2½ miles near Armentières, where it is crossed by the Lys. The area is 2192.5 square miles, and the population, in 1846, was 1,132,980, being 516.517 to the square mile, or 342.167 above the average per square mile for all France.

The department belongs almost entirely to the basin of the Escaut. It has a general inclination towards the north-east. The surface, except in the south of the department, is level. Some isolated hills spring up here and there, which seem to be higher than they really are in consequence of the general flatness of the country. Mont-Cassel, in the arrondissement of Hazebrouck, famous for the extensive view from its summit, is only 361 feet above the sea-level. The arrondissement of Avesnes, in the south of the department, is a hilly country; it is covered by the northern slopes of the Ardennes, many of which are covered with forests, while the narrow vales are furrowed by the Helpe-Majeure, the Helpe-Mineure, and a great number of smaller streams that flow into the Sambre, a feeder of the Meuse. The Ardennes Hills extend also into the arrondissement of Cambrai, and form the watershed between the Sambre and the Escaut. The hills of this arrondissement are all of gentle slope, and generally cultivated to their summits; the loftiest of them, Bonavis, the summit of which is the highest point in the department, is only 394 feet above the sea. In the arrondissement of Dunkerque, which extends about 25 miles along the sea-coast, a considerable portion of the surface is very little, if anything, above the sea, and marshy, but maintained in a state fit for cultivation by a system of drainage called *Watteringues*. The Watteringues district, which contains an area of 95,327 acres, is divided into 4 sections, each under the care of commissioners appointed for the purpose of seeing the works kept in repair. Between these lands and the sea extends a melancholy fringe of sand, bordered near the sea by sand-hills called *dunes* or downs. The canal from Bergues to Furnes, which forms one of the outlets for the waters raised from the Watteringues country, separates this from the district of the *Moëres*, consisting of the basins of two lakes drained in a similar way by canals, windmills, and dykes; the Moëres district is under a separate administration. The marsh-lands in the valleys of the Scarpe, the Escaut, the Sambre, and in various other districts, are each subjected to a system of drainage regulated by commissioners, who are appointed under the authority of the prefect of the department, by the proprietors interested in the reclamation of the lands.

The soil is in general good; but in such an extent of surface the variety of course is great, from the deep rich clay and marly soil of the arrondissement of Lille, to the barren sand-hills on the coast, and to the light gravelly soil of the southern districts. But everywhere the system of agriculture is good, and fine crops of great variety are gathered. Of the whole surface, which measures 1,403,824 acres, 1,175,224 acres are under cultivation, namely, 888,549 acres under plough-culture, 236,817 acres of meadow and grass-land, 40,372 acres of gardens, orchards, and nurseries, and 9486 acres under various culture. Of the remaining surface, 88,532 acres consist of forest land, a large portion of which lies in the arrondissement of Avesnes; 17,501 acres are barren bog and heath; 50,618 acres are covered with roads, streets, and buildings; and 57,470 of forest domain are the property of the state.

The crops grown for the sustenance of man and the domestic animals are—wheat, mixed grain, spelt and buck-wheat, rye, barley, oats, peas, beans, and other leguminous seeds. The produce of these crops, taking one year with another, is now sufficient for the consumption; formerly

this was not the case, though the population was then smaller. The harvest of 1848 yielded of the above grains 2,124,549 quarters; the consumption was 2,183,877 quarters, leaving a deficiency of 59,328 quarters; but then the harvest of 1847 yielded an excess above the consumption of 192,643 quarters. This diminution in the yield of 1848, amounting to 251,971 quarters less than that of 1847, applied to all the kinds of produce mentioned, but most particularly to the wheat and oat crops. Of potatoes, the produce is not nearly equal to the consumption, which in 1848 was 7,700,600 bushels, while the quantity grown was only 2,960,264 bushels; this deficiency was partly caused by the disease which has attacked the tubers during the last few years. Authority was given to plant 2498 acres with tobacco in the present year (1849), calculated to furnish 63,070 cwt. of leaf. The other objects of the farmer's care are clover, lucern, oleaginous seeds, beet-root, turnips, colza, flax, (of which in 1848 13,338 hogsheads of the seed, and 352,429 hundred-weight of dressed fibre were produced), and hemp. Of hay and straw, the yield of 1848 was 142,398 tons and 612,401 tons respectively. The number of wind, water, and steam-mills for the manufacture of oil and flour, in 1848, was 1367. A good deal of the barley grown in the department is used for malting, beer being the common beverage; other grain and potatoes are also used in the gin and other spirit distilleries. Apples, pears, nuts, and other common fruits are cultivated; flowers too are objects of especial attention; hops are grown.

The horses of the department are large, strong, and of good breed. A great number of horned cattle are fed on the natural pastures and on the abundant green crops that are raised. The number of sheep reared to supply the markets with mutton and for the growth of wool is very considerable. Good butter and passable cheese are made. Pigs, poultry, and fish are abundant. Bees are kept chiefly in the south of the department. Coal is the common fuel, wood being scarce. Timber trees are grown along the roads and in the hedgerows.

The principal rivers of the department are—the *Aa*, which runs along the western boundary, and enters the North Sea at Gravelines, where it forms a small harbour: the *Yser*, which receives the *Peene* below Wormhout, and runs N.E. into Belgium: the *Lys*, a feeder of the Escaut, which is itself fed by the *Lawe* and the *Deule:* the *Scarpe*, which, rising in Pas-de-Calais, runs E. past Douai, and joins the Escaut at Mortagne, on the Belgian frontier: the *Escaut*, which, rising in the north of the department of Aisne, flows N. to Cambrai, whence it runs N.E. past Valenciennes and Condé, 7 miles N. of which it enters Belgium, having received the *Sensée* at Bouchain, the *Selles* and the *Escaillon* between Bouchain and Valenciennes, and the *Haine* at Condé: and the *Sambre*, which crosses the south of the department, passing Landrecies and Maubeuge, below which it enters Belgium on its way to join the Meuse. Most of these streams, and many smaller ones, have been rendered navigable; they, with the 25 canals that traverse the department in all directions, afford an internal navigation of 308 miles. Of these canals, particular mention must be made of the St.-Quentin Canal, which, running from Cambrai to St.-Quentin, unites the Escaut to the Somme, and completes the internal navigation of France between the North Sea, the Atlantic, and the Mediterranean.

Roadway accommodation is afforded by 15 national (formerly royal), 17 departmental, and 50 parish roads, to the extent of 1029 miles in length. Railroads traverse the department in several directions, uniting Valenciennes, Douai, Lille, Dunkerque, and the intermediate towns with Paris, Calais, Antwerp, and Brussels. Lille communicates with Paris by electric telegraph.

The mineral wealth of the department consists chiefly of its coal and iron mines; of the former 19, all situated in the valley of the Escaut, were worked in 1848, and of the latter, 3 were worked in the arrondissement of Avesnes. Steam-engines are used for draining the mines. Marble, paving stones, brick-earth, potter's clay, peat, and fossil ashes, which are used as manure, are found. There are mineral waters and baths at St.-Amand.

The industrial products of the department are of the most varied description, including all kinds of woollen, cotton, and linen manufactures, ticking, duck, velveteen, printed cottons, and handkerchiefs, woollen, flaxen, cotton, and hempen yarn, lace, tulle, cambric and lawn, soap, refined sugar and salt, beer, oil, nails, glass, paper, tiles, bricks, earthenware, ropes, leather, toys, small wares, cannon, small arms, saltpetre, &c. These numerous products form the items of a large home and foreign commerce. The imports are chiefly raw cotton, wool, flax, colonial produce, wine, brandy, and timber. At the principal points on the Belgian frontier custom-house officers are stationed, who are under the direction of the custom-houses of Dunkerque and Valenciennes.

Among the principal educational, benevolent, and administrative institutions of the department are—at Douai a University-Academy, which confers degrees, and a Normal school; lyceums at Douai and Lille, in which science and language are taught; 15 communal colleges for pensioners, foundationers, and day students; societies of medicine and botanical gardens at Douai and Lille; public and lending libraries, and museums in all the principal towns; 47 hospitals, 5 of which are general, 7 for the sick, and the rest for special inmates; 2 institutions for deaf-mutes, one at Lille for girls, and one at Fives for boys; 6 lunatic asylums; 6 lying-in societies for the poor under the direction of ladies; a central prison at Loos, where the silent system is rigidly enforced except among the junior convicts; and 8 communal prisons. There is a branch of the Bank of France in Lille; 5 monts-de-piété, and 9 savings banks in the large towns. In almost every commune there are *bureaux de bienfaisance*, supported by charitable bequests, for the distribution of relief in food, clothes, child-bed linen, or money to poor householders. There are 5 Protestant oratories at Lille, Quiévy, Walincourt, Inchy, and St.-Amand. The Jews have

synagogue at Lille. Besides these, there are numerous scientific and agricultural societies; special academies, in which painting, music, applied mathematics, hydrography, zoology, clinical medicine, chemistry, architecture, designing, modelling, &c., are taught. The number of journals and periodicals published in the department is 32. In 146 communes there are societies of nuns and religious women, who attend the sick in the hospitals and at their homes, and devote themselves to the consolation of the old and the education of the young.

The department is divided into 7 arrondissements, which, with their subdivisions and population in 1846, are as follows:—

Arronds.	Cantons.	Communes.	Pop. in 1846.
Lille . . .	16	132	356,795
Douai . . .	6	66	99,921
Dunkerque. .	7	59	104,592
Hazebrouck .	7	53	104,690
Avesnes . .	10	153	142,245
Valenciennes .	7	81	150,643
Cambrai . .	7	118	174,094
Total . .	60	662	1,132,980

Of the arrondissement of Lille and of the whole department the capital is LILLE. ANZIN. *Armentières*, a clean well-built town on the Lys, 9 miles by railway N.W. from Lille, has a college and 7959 inhabitants. It is a busy manufacturing place; the chief products are beet-root sugar, table linen, ticking, hosiery, lace, printed calicoes, flaxen and cotton yarn, tulle, soap, spirits distilled from corn, bricks, &c.; there are also several bleach-works, dye-houses, and salt-refineries. The town has an active commerce in its industrial products, and in corn, wine, brandy, tobacco, iron, nails, sausages, &c. *Comines*, a pretty little town of 5225 inhabitants, situated on the frontier, 10 miles N. by E. from Lille, stands on the Lys, which divides it into two parts. The part on the right bank has belonged to France since the treaty of Utrecht in 1713; the part on the left bank is in the Belgian province of West Flanders. Tape, cotton stuffs, linen thread, beer, spirits, oil, flour, and leather, are the chief industrial products. *La Bassée*, S.W. of Lille, on the canal to St.-Omer; *Cysoing*, S. by E. of Lille; and *Haubourdin*, S.W. of Lille, are small manufacturing towns with under 3000 inhabitants each. *Halluin*, 10 miles N.N.E. of Lille on the right bank of the Lys, has a population of 4264, who manufacture calico, table linen, ticking, cotton yarn, bricks, and oil. Near Haubourdin is the village of *Loos* (population 3404), the former abbey buildings of which are now converted into a central prison. *Le-Quesnoy*, on the lower Deule, a few miles north from Lille, has 3551 inhabitants, who manufacture nails, anvils, chains, crucibles, oil, beer, coarse linen, &c. *Roubaix*, 6 miles by railway N.E. from Lille, one of the principal centres of the woollen trade in the north of France, is a well-built town, with a council of Prud'-Hommes, a commercial court, and 31,039 inhabitants. At the beginning of the present century the population was only 8000; in 1830 it was 13,132. Besides its elegant tissues of wool, the articles manufactured are table linen, furniture cotton, nankeens, waistcoat pieces, woollen and cotton yarn, leather, gin, &c. These products, together with corn, wine, and colonial produce, form the items of a considerable commerce. *Seclin*, S. of Lille, a station on the Lille-Douai railroad, has a manufacturing population of 3240. *Tourcoing*, about 2 miles N. by railway from Roubaix, is an important manufacturing town, and has a college, a council of Prud'-Hommes and 26,834 inhabitants. The town is well built, with wide straight streets and several good public buildings, the most remarkable of which are the town-hall and the churches of St.-Christophe and St.-Jacques. Tourcoing is a great mart for the sale of wool, which, after being washed and combed, is despatched to the manufacturers of Roubaix, Amiens, and St.-Quentin. The principal manufactures are table linen, duck for trousers, swanskin, camlet, velveteens, cotton and woollen yarn, refined sugar, soap, grain spirits, &c.

In the arrondissement of Douai, the chief town is DOUAI. The other towns are *Arleux*, S. of Douai, population 1800: *Marchiennes*, an ill-built town on the Scarpe, E. of Douai, population 2965: and *Orchies*, N.E. of Douai, which is girt with a wall and fosse, and has 3568 inhabitants, who manufacture oil, soap, pottery, beer, gin, leather, and flaxen yarn.

In the arrondissement of Dunkerque the chief town is DUNKERQUE. *Bergues-St.-Winoc*, 5 miles S. from Dunkerque, on the railway that joins the Lille-Calais line at Hazebrouck, stands at the junction of several canals, by one of which, communicating with the sea, vessels of 300 tons can reach the town. It is well built, with good brick houses, and has 6045 inhabitants. The town-house, the beffroi or clock-tower, and the two towers of the old abbey of St.-Winoc, which serve as landmarks to sailors entering the harbour of Dunkerque, are the most noteworthy objects in the town. The manufactures consist of soap, hosiery, cotton-yarn, sugar, salt, distilled spirits, leather, &c.; boats are built; and there is a considerable trade in corn, cheese, butter, wine, and cattle. This town was strongly fortified by Vauban, and is considered a fortress of the first class. *Bourbourg*, in an unhealthy marshy situation near the right bank of the Aa, has oil-mills, breweries, salt-works, and 2503 inhabitants. *Gravelines*, a fortified seaport town, 12 miles W. from Dunkerque, built in a marshy spot at the mouth of the Aa, has a lighthouse, and 5582 inhabitants. The town is pretty well built; the arsenal is the most remarkable object. The fortifications constructed by Vauban render the town impregnable towards the sea; on the land side it may be surrounded with water at pleasure. The principal articles of trade are—wine, brandy, gin, salt, timber, salt-fish, refined sugar, beer, &c. Vessels are fitted out for the herring, cod, and mackerel fisheries. *Hondschoote*, a few miles E. of Bergues, on the Basse-Colme Canal, has tan-yards, breweries, oil-mills, bleach-works, and 3971 inhabitants.

Wormhoudt, 11 miles S. from Dunkerque, situated on the Yser, is one of the cleanest and prettiest towns in French Flanders. It has 3828 inhabitants, several bleach-mills, breweries, brick-works, oil-mills, and tan-yards.

In the arrondissement of Hazebrouck, the chief town *Hazebrouck*, situated on the Bourre, a small feeder of the Lys, and at the point where the railway from Lille diverges to Calais and Dunkerque, has a tribunal of first instance, a college, and a population of 7574. The town, which is 25 miles distant from Lille and Dunkerque respectively, is well built, and possesses several handsome public buildings; among which are the parish church, the town-house, the sub-prefect's residence, and the old Augustinian Convent, the several parts of which are now used as college lecture-rooms, tobacco warehouse, hospital, corn-market, and a normal school. Among the industrial products of Hazebrouck are linen cloth and twist, soap, leather, refined salt, beer, oil, and lime. A great linen market is held every Saturday. *Bailleul*, 9 miles from Hazebrouck, on the railway to Lille, stands on high ground, and is in general a well built town, with regular streets and tastefully constructed houses. The sculptured decorations over the doors of the best mansions represent subjects taken from the scriptures, and give an idea of the taste and of the religious feeling of the French-Flemings. The most remarkable public structures are the church of St.-Vaast and that which belonged to the former Jesuit College. The industrial products are linen of all kinds, tape, beet-root sugar, pottery, soap, refined salt, beer, oil, bricks, leather, and flour. There is considerable trade also in corn, beans, cheese, poultry, and cattle, of which great numbers are fed on the fine pastures round the town. Bailleul has 10,141 inhabitants. *Cassel*, said to be the *Castellum Menapiorum*, is built on an isolated conical hill, in the midst of a fertile and extensive plain, 6 miles by railway N. from Hazebrouck, and has a college and 4410 inhabitants. The town is neat, clean, and supplied with water from an abundant fountain. The summit of the hill, on which the town is built, is the highest point in French Flanders, and presents one of the finest views of the kind in Europe, comprehending the harbours of Dunkerque, Gravelines, and Calais, 32 towns, above 100 church and clock towers, marking so many towns, villages and hamlets, scattered over a varied and fertile plain. Lace, linen, hats, stockings, soap, coarse pottery, leather, and oil, are the chief industrial products; there is also some trade in corn, butter, beans, poultry, and cattle. *Estaires*, 11 miles S.E. from Hazebrouck, formerly a fortified but now an open town, stands on the Lys, and has a college and 6890 inhabitants. The manufacture and bleaching of linen, the preparation and spinning of flax, nail-making, and boat-building are the leading occupations of its population. *Merville*, at the junction of the Bourre canal with the Lys, 8 miles S. from Hazebrouck, is a well built town with a population of 6079. It has important manufactures of damask and linen cloth; and also salt. refineries, breweries, and brick-works. *Stenvoorde*, N. by E. of Hazebrouck, near the Belgian frontier, has a custom-house and 3863 inhabitants, who manufacture woollen stuffs, linen, pottery, beer, leather, and tiles. A great deal of hops are grown near this town.

The arrondissement of Avesnes takes its name from *Avesnes*, a small well built fortified town, situated on the Helpe, a feeder of the Sambre, in the former territory of Hainaut, 54 miles S.E. from Lille. It has a tribunal of first instance, a college, and 3578 inhabitants, who manufacture hosiery, gin, soap, leather, and bricks; there are also salt-refineries, marble-works, and in the neighbourhood iron mines, iron forges, and smelting furnaces, naileries, and glass-works. *Bavay*, 15 miles N. from Avesnes, a small place of only 1700 inhabitants, marks the site of the Roman *Bajacum*. It contains several traces of its founders, among others the ruins of a circus and an aqueduct. In the middle of the town a heptagonal column marks the point where 7 Roman roads, called *Chaussées Brunehaut*, met. *Berlaimont*, N.W. of Avesnes on the Sambre, has 2099 inhabitants. *Landrecies*, a fortified town on the Sambre, 12 miles W. from Avesnes, has a handsome church, large barracks, and 3991 inhabitants. The Sambre is navigable at this place; and there is a good trade in corn, hops, flax, cheese, wood, charcoal, slates, cattle, and glass bottles. *Maubeuge*, a well built fortified town on the Sambre, by which it exports the coal, marble, and slates found in the neighbourhood, has 7328 inhabitants. The manufactures consist of ironmongery, tinware nails, soap, beet-root sugar; there are also marble works, tan-yards, a salt-refinery, and a government manufactory of fire-arms. *Le-Quesnoy*, another fortified town 17 miles N.W. from Avesnes, is prettily situated on a hill above a fertile and extensive plain, fringed by the forest of Mormal, and has 3922 inhabitants, cotton-spinning factories, tan yards, and breweries. It is a pretty brick-built town, with a handsome town-house, an arsenal and a remarkable church, founded in the 11th century. *Solre-le-Château*, situated on the Solre 7 miles N.E. from Avesnes, has fulling-mills marble-works, tan-yards, naileries, glass-works and manufactures of lace, serge, blankets, and woollen yarn; population 2645. *Trélon*, 8 miles S.E. from Avesnes, has 2000 inhabitants, who manufacture hosiery, chemical products, iron, and lime.

Of the arrondissement of Valenciennes the chief town is *Valenciennes*, which is situated on the railway from Paris to Brussels, 22 miles S.E. from Douai, at the junction of the Rhonelle with the Escaut, and has 22,040 inhabitants. The town which is surrounded by fortifications and defended by a citadel constructed by Vauban, is pretty well built, but the streets are crooked, narrow, and irregular. The town-hall, the theatre, the hospital, the church of St.-Géry; the public library, which contains 18,000 volumes; and the academy of painting, sculpture, and architecture, are among the most remarkable buildings and establishments in the town. The beffroi, or clock-tower, which was erected in 1237, fell down April 7, 184 Valenciennes has tribunals of first instance and

commerce, a college, a custom-house, an arsenal, large provision stores, and barracks. The principal manufactures are lawn, lace, hosiery, toys, nails, oil, soap, colours, pottery, &c.; there are also cotton-printing factories, oil-mills, beet-root sugar factories, dye-houses, bleach-works, tan-yards, and grain distilleries. ST.-AMAND-LES-EAUX. *Bouchain* stands in a strong position on the Escaut, 11 miles S.W. from Valenciennes; it is fortified, and has 1400 inhabitants. *Condé-sur-l'Escaut*, 8 miles N.E. from Valenciennes, is situated on the Escaut, close upon the Belgian frontier, and has a population of 5103. It is a well built fortified town, and possesses a handsome town-house and an arsenal. The defences were constructed by Vauban; by means of a sluice the town may be surrounded by water. Oil, salt, nails, ropes, and leather, are the chief industrial products; boats are built; there are also chicory-mills, dyehouses, and bleach-works. *Denain*, situated 5 miles by railway W. from Valenciennes in the centre of a rich coal-field, on the left bank of the Escaut, has a population of 5144. This town has sprung up almost entirely since 1826, when the population was only 900. The streets are straight and regular; here and there are iron forges and smelting-furnaces, and shafts leading to the mines with short railroads, by which the coals are conveyed to the docks on the river bank. There is a good market in the town; beet-root sugar is manufactured. Denain is celebrated for the defeat of the allies under Lord Albemarle by the French under Marshal Villars, July 23, 1712. A short way S. of Condé is *Fresnes*, or *Frênes-sur-l'Escaut*, which has glass-works, distilleries, breweries, steam flour mills, and 4109 inhabitants, many of whom are employed in the several coal-mines of the neighbourhood.

The arrondissement of Cambrai is named from its chief town CAMBRAI. *Cateau-Cambresis*, 15 miles S.E. from Cambrai, on the right bank of the Selle, is a well-built town, with a college and 7686 inhabitants. The town, which is famous for the treaty signed in it between Philip II. of Spain and Henri II. of France in 1559, takes its name from the château (corruptly pronounced cateau), built for its protection, and from its position in the Cambresis or territory of Cambrai. The former archbishop's palace, now converted into a cotton factory, is the most imposing structure in the town. The manufactures are shawls, merinos, lawn, calico, soap, woollen and cotton yarn, beer, gin, leather, and salt. *Solèsmes*, famous for its Benedictine abbey, still subsisting, stands 12 miles E. from Cambrai, and has 5295 inhabitants, who manufacture lawn, gauze, merino, cotton stuffs, beer, leather, soap, &c. The parish church is a large handsome structure, surmounted by a spire above 200 feet high. *Crèvecœur*, situated near the right bank of the Escaut, and famous for the defeat of Chilperic II. by Charles Martel, March 21, 717; and *Clary*, S. by E. of Cambrai, are small places of a little over 2000 inhabitants each.

(*Dictionnaire de la France; Annuaire du Département du Nord pour l'An* 1849.)

NORDEN. [AURICH.]

NORDHAUSEN. [ERFURT.]

NORFOLK, a maritime county of England, on the eastern coast. It is bounded S.E. and S. by Suffolk, S.W. and W. by Cambridgeshire and Lincolnshire, N.W. by the Wash, and on all other sides by the North Sea, or German Ocean. Its greatest length E. to W. is 65 miles; its greatest breadth N. to S. is 40 miles. The area is 2024 square miles. The population in 1841 was 412,664.

Coast-line and Surface.—The Norfolk coast commences at the æstuary of the Yare, and extends in a regular convex outline to the Wash. It is liable to continual encroachments from the sea, which, especially about Cromer, has gained much on it. It is for the most part low. The Wash is an æstuary, having extensive sand-banks dry at low-water, with channels of deeper water between them. The Ouse and the Nene both flow into it. The deeper water off the Norfolk coast is known as Lynn Deeps. There are a number of creeks and harbours on the Norfolk coast:—Yarmouth, Cley and Blakeney, Wells, Burnham, Brancaster, Thornham, Heacham, Snettisham, and Lynn.

Norfolk contains no hills. The rivers flow through valleys of varying breadth, skirted by low rising grounds or uplands. The highest ground in the county is probably on the north-west side, where the chalk downs appear. This high ground subsides gradually toward the east, where the chalk sinks under the beds of alluvium which overspread a large portion of this county. The western part of the county is included in the great Fen district.

Chalk is dug for lime in many places; excellent sand for glass-making is procured between Snettisham and Castle Rising; some potter's-earth is found and excellent brick-earth; marl is dug in the valley of the Bure; and the Fen districts of the west furnish peat for fuel and manure.

The principal streams flow from the north-west part of the county, where the chalk occupies the surface. The Wensum rises in the neighbourhood of Fakenham, and flows south-east in a winding channel 45 miles to Norwich, 2 miles below which it joins the Yare. The Yare rises at Shipdam, between Watton and East Dereham, and flows eastward to the junction of the Wensum 25 miles. The united stream flows 20 miles, till it expands into a large sheet of water called Breydon Water, 4 miles long, and in some parts a mile broad, at the south-western extremity of which it receives the Waveney, and at the north-eastern the Bure; after receiving which it bends and flows 3 miles southward into the German Ocean. The Waveney rises at Lopham, between Thetford and Diss, and flows past Diss, Harleston, Bungay, and Beccles, to its junction with the Yare, nearly 50 miles. The Bure rises in the northern part of the county, and flows past Aylsham 50 miles, to its junction with the Yare. These rivers form many shallow lakes or pools called *broads* or *meers*.

The streams of the western side of the county belong chiefly to the system of the Ouse, which touches the border of the county near Littleport,

a few miles below Ely, and flows northward 22 miles into the Wash below Lynn. The Norfolk rivers of this system are the Little Ouse, the Wissey, the Nar, and the Welney.

Beside these rivers a number of smaller streams fall into the sea along the north coast.

Few parts of England exhibit marks of more remarkable changes than this county. The valleys of the Waveney, Yare, and Bure were originally longitudinal basins of chalk; and subsequently to the deposition of those beds of gravel and sand, which cover a large portion of this side of the island, were probably arms of the sea. The low flats north of Yarmouth, in which are so many 'broads,' were also parts of an æstuary which probably remained till the time of Edward the Confessor, but has since been left dry. There are local traditions of the sea having once reached Norwich on the Wensum, and Bungay Castle on the Waveney. Indeed it is supposed that the eastern part of Norfolk was once a group of low islands.

The Wensum and Yare are navigable to Norwich for sea-borne vessels; and these, as well as the Waveney, have been greatly improved for navigation by artificial means. There are a few short canals in connection with the rivers. The county is well accommodated with railways by the Norfolk, the East Anglian, and the Eastern Union Companies.

Climate, Soil, and Agriculture.—The climate of Norfolk is somewhat colder than that of the southern and western counties of England. The coast is exposed to the north-east winds, and the whole of the county is nearly a continued plain, with only slight undulations of the surface. Except in a small portion of the county on its western boundary, and a strip along the southern part, which are marshy, the air is dry and healthy. It is, on the whole, as favourable to the tillage of the land and the growth of corn as any part of England.

The soil may be divided into three classes: light sands of various qualities, chiefly in the north-western part of the county; low alluvial clays and loams, on the borders of Lincolnshire and Cambridgeshire; and loams of various qualities, chiefly light, incumbent on a marly clay, in the centre and eastern part. There is a strip of peat and marsh along the southern boundary.

The district in which the true Norfolk system of cultivation was first adopted, and where turnips and clover were introduced in the regular rotations, was that on the north-west, where the better kinds of sand prevail. From this district it has gradually spread; and there are now few soils in Norfolk which are considered too heavy to bear turnips, especially after having been well underdrained.

The crop which is raised in the greatest perfection in Norfolk is barley. It may be considered as the most important portion of its agricultural produce. There are few counties where such an extent of poor unproductive land has not only been brought into cultivation, but made equally productive with those which are naturally fertile, as in Norfolk. This has been effected chiefly by laying considerable portions of the marly clay, found a little below the surface, on the poorer soil which was at the surface, and by an excellent system of draining the land where the subsoil is impervious to water.'

Divisions and Towns.—Norfolk is divided into 33 hundreds. It is in the diocese of Norwich. It is in the Norfolk circuit, and the assizes are held at Norwich. For parliamentary purposes the county is divided into East Norfolk and West Norfolk, each of which returns 2 members to parliament. The city of Norwich returns 2 members; and 2 members are returned respectively for the boroughs of Yarmouth, Thetford, and King's Lynn, making 12 members in all.

The following are the principal towns, with the population of each in 1841 :—

Attleburgh, a market town, 14½ miles S.W. from Norwich, and 16 by the Eastern Counties Railway, is a small place. Population of the parish, 1959.

Aylsham, a market town, 12 miles N. by W. from Norwich, is situated on the right bank of the river Bure. The church contains some monumental brasses, and a richly carved font. Population of the parish, 2448.

New Buckenham is a market town, 16 miles S.W. from Norwich. The neighbouring village of *Old Buckenham* had a castle at the time of the Conquest. A new castle was erected in the 12th century, round which a town grew up, to which the name of New Buckenham was given. A few ruins of the gateway and keep of this castle remain. The town has some neatly-built houses. The church is large, and an ancient structure, partly rebuilt near the close of the 15th century. Population of the parish of New Buckenham, 716; of Old Buckenham, 1255.

Burnham, called Burnham Westgate, to distinguish it from other places of the same name, is a small town, 33 miles N.W. from Norwich, situated on the west side of a small river, the Burn, at the mouth of which is a small harbour. Population of the parish, 1126. *Brancaster*, a village 5 miles W.N.W. from Burnham, is supposed to have been the site of the Branodunum of the 'Itinerary' of Antoninus.

Cley, a market town, 24 miles N.W. by N. from Norwich, is situated on the east side of a small river, and Blakeney on the west side, and the mouth of the river forms a small harbour called Cley and Blakeney Harbour. Population of the parish of Cley, 828; of Blakeney, 1021.

Cromer, 20 miles N. from Norwich, is a small fishing town. The church is a very beautiful building, in the perpendicular style. Population of the parish, 1240.

East Dereham is a market town 16 miles W. by N. from Norwich, but considerably further by the Eastern Counties Railway, which has a branch to Dereham from the Wymondham station. The town is pleasantly situated, and has been much improved of late years. The church is a large cruciform building of considerable antiquity. In the north transept is a monument to the poet Cowper, who was buried there in 1800. Population of the parish, 3834.

Diss is a market town, 19 miles S. by W. from Norwich. The town is irregularly laid out on a very uneven site; but contains many good houses. The church is an ancient building. Population of the parish, 3205.

Downham is a market town, 37 miles W. from Norwich, and 11 miles from Lynn, by the East-Anglian Railway. It is situated near the east bank of the Ouse. It is a very ancient town, consisting of three well-paved streets. The church is an ancient building, with a low embattled tower. Population of the parish, 2953.

Fakenham, distinguished from other places of the same name, as Fakenham Lancaster, is a market town, 24 miles N.W. from Norwich. The town is situated near the river Wensum, on a pleasant declivity. The streets are paved. The church is handsome and commodious. There is an ancient market-cross. There is a corn-market on Thursday, one of the largest in the county. Population of the parish, 2158.

Foulsham is a market town, 17 miles N.W. from Norwich. The town was nearly destroyed by fire in 1770; and the houses have since been rebuilt on a more regular plan and in a more respectable style. The church is a handsome building of flint and stone, rebuilt at the same time as the town. Population of the parish, 1043.

Harleston is a market town, 17 miles S. from Norwich. The town consists of a main street along the Yarmouth Road, and a convenient market-place on the south side of the main street. The river Waveney flows at a short distance to the south. The parish church of Redenhall is situated on an elevation a mile from the town on the road to Yarmouth. Population of the chapelry, 1425.

East Harling is a market town, 19 miles S.W. from Norwich by the road, and 23 by the Eastern Counties Railway. The church has a square tower, and a small spire at the west end. It contains a handsome carved screen and some stained-glass windows. Population of the parish, 1062.

Hingham is a small town, 14 miles W. by S. from Norwich. It is irregularly laid out, but contains some good houses. The church is large and handsome, chiefly in the decorated English style. Population of the parish, 1691.

Holt, a market town, 20 miles N.N.W. from Norwich, is advantageously situated at the junction of several roads in the midst of a pleasant country. It is irregularly laid out, but the houses are neatly built and the streets paved with flints. The town contains a neat and commodious sessions-house and a church. Population of the parish, 1604.

Loddon, 10 miles S.E. from Norwich, is a small place situated on a stream which flows into the Yare. The village of Chedgrave is so closely adjacent that the two form one town. Loddon church is a fine stone building with an elegant tower, mostly of perpendicular character. Chedgrave church has a fine Norman door and other ancient portions. Population of the parish, 1197.

Lynn, distinguished as *Lynn Regis*, or *King's Lynn*, a parliamentary and municipal borough, port, and market town, is situated on the right bank of the Ouse, a little above its outfall. It is 40 miles W. by N. from Norwich, and 26¾ miles N. by E. from Ely, by the East-Anglian Railway. It also communicates with Norwich and Wymondham by the Dereham branch of the Eastern Counties Railway. Lynn is supposed to have existed before the Conquest, and to be on the site of an old Roman town. At present it extends in length about a mile on the east bank of the river, and is about half a mile in breadth. It is traversed or bounded by several narrow streams, over which there are many bridges. By bridges about a mile above the town, over the Eau Brink, which is a modern cut, and the old channel of the Ouse, there is communication with West Lynn, Wisbeach, and the Lincolnshire Fens. There are yet remaining a few fragments of the old walls which defended the town, and also one of the original gates. On the north side of the town is St. Ann's Fort, a battery of heavy guns, intended to guard the passage of the river. The town is well paved and lighted. The three principal streets are parallel with the river; smaller streets connect them, or branch out from them. The houses are chiefly old and inconvenient, except in the more modern parts of the town. The guildhall, an ancient building of stone and flint, contains court-rooms, assembly-rooms, &c. There are also a borough gaol, an exchange and custom-house, an excise office, and a theatre. The church of St. Margaret is a cross church of spacious dimensions, containing portions of the early, decorated, and perpendicular styles of English architecture. The chapel of St. Nicholas is a spacious edifice, chiefly of decorated or perpendicular English architecture. All Saints church is also a cross church, but of smaller dimensions than St. Margaret's. The chapel of our Lady on the Mount, or Red Mount Chapel, on the east side of the town, is remarkable for its beauty. Rope and sailcloth are almost the only articles of manufacture in the town. But the trade of the place is considerable, owing to the harbour. It is shallow however, and the channel by which it is approached from Lynn Deeps is rather intricate. The exports are principally corn and agricultural produce, sent coast-wise, and a fine white sand ground near the town, and used for making glass. A vast quantity of shrimps, caught on the shores of the Wash, are sent to London. The imports are corn and coal; timber from America; timber, deals, hemp, and tallow from the Baltic; wine from France, Spain, Portugal, &c. The number of vessels belonging to the port on Dec. 1, 1847, were:—under 50 tons, 38; above 50 tons, 131; with an aggregate tonnage amounting to 18,858 tons; and three steamboats of 310 tons altogether. The municipal borough is divided into 3 wards, and is governed by 6 aldermen and 18 councillors: population, 16,039. The parliamentary borough returns 2 members: population, 51,751.

Norwich. [NORWICH.]

Swaffham, a market-town, 14 miles S.S.E. from Lynn by the East Anglian Railway, stands on an eminence, and consists of four principal streets. The houses are generally well-built, and the town has a neat theatre, an assembly-room,

and a house of correction. The church is the finest in the neighbourhood. It is built in the form of a cross, with an embattled tower at the west end, and contains some interesting monuments. Population of the parish, 3358.

Thetford, a market town, parliamentary borough, and municipal borough, 31¼ miles W.N.W. from Norwich by the Eastern Counties Railway. The town is situated chiefly on the N.E. or Norfolk bank of the Little Ouse; a smaller part is on the opposite side, or Suffolk bank. The town is irregularly built, but has a neat and clean appearance. It has few or no manufactures; but there is a good deal of malting, and the trade of the place is favoured by the river being navigable up to the town; by means of which an export of agricultural produce and an import of coal are carried on. St. Peter's church has a tower, which was rebuilt in 1789. St. Cuthbert's church, an ordinary structure, has an embattled tower. Both these churches are in Norfolk. St. Mary's church, on the Suffolk side of the river, is meanly built. There is an ancient grammar school. The municipal borough is governed by 4 aldermen and 12 councillors: population, 3943. The parliamentary borough returns 2 members: population, 3844.

North Walsham, a market town, standing on a gentle eminence above the river Ant, 14 miles N. by E. from Norwich, consists of a few irregularly laid out streets. The church is a spacious and magnificent building, an early specimen of the perpendicular style. The silk manufacture is prosecuted here to some extent. A navigable canal, connected with the navigation of the Ant and Bure, opens a water communication between this town and Yarmouth. Population of the parish, 2655.

New Walsingham, 25 miles N.W. from Norwich. The town is chiefly remarkable for a chapel and convent which formerly existed in the neighbouring parish of Old Walsingham. An image of the Virgin belonging to the foundation was held in such high regard, that pilgrimages to the shrine of 'Our Lady of Walsingham' were even more frequent than those to the shrine of St. Thomas à Beckett, and the possessions of the priory were augmented by large endowments and costly presents. There are yet some fine remains of the convent. The town is near the river Stiffkey. The church, which is an ancient building, contains an old font, the carving of which is among the richest specimens in England. Population of the parish, 1155.

Watton is a small market town, 21 miles W.S.W. from Norwich. It stands in the midst of a dairy country, from which a considerable quantity of butter is sent to London. The church, which is at some distance from the town, has a round tower with an octangular top; it is supposed that some parts of the building are as old as the time of Henry I. Population of the parish, 1188.

Wells, a market town, 28 miles N.W. from Norwich, is situated on a slight elevation rising above the marshy flat which here lines the coast, and about half-a-mile from the sea, on a creek, the mouth of which forms the harbour. The shifting sands render this harbour difficult of access, but considerable improvements have been made in it. The town consists of two principal streets, partially paved, and of some smaller streets. There is a custom-house on the quay; there is also a theatre. The trade of the port is considerable. Corn and malt are shipped; and coals, timber, deals, bark, tar, and wine, are imported. Population of the parish, 3504.

Wymondham (pronounced and occasionally written Windham) is 10½ miles S.W. from Norwich by the Eastern-Counties Railway. The town grew into importance through a monastery, which was established here at the beginning of the 12th century. It is of considerable extent, and has been much improved of late years. The church is of different styles and periods; the Norman arches of the nave may be regarded as belonging to the original building. The bombazine manufacture is carried on to a considerable extent. Population of the parish, 5179.

Yarmouth. [YARMOUTH.]

History and Antiquities. Norfolk formed part of the dominions of the Iceni, or Simeni, a people who allied themselves with the Romans in the time of Claudius. In the Roman division of Britain, Norfolk was included in the province of Flavia Cæsariensis. There were many British and Roman towns or posts in this county.

In the general conquest of England by the Saxons and their kindred tribes, Norfolk and Suffolk and some parts of the adjacent counties were formed into the kingdom of East Anglia. In the great invasion of England by the Danes, or Northmen, under the sons and kinsmen of Lodbrog, East Anglia was the first part attacked. The Northmen landed and formed a camp, in which they passed the winter, demanding and receiving from the East Anglians a supply of horses (A.D. 866).

After the Conquest the earldom of Norfolk and Suffolk was bestowed on Ralf de Guader; but he having rebelled was besieged in Norwich Castle, and being forced to surrender was banished, and the earldom of Norfolk bestowed by William the Conqueror on Roger Bigod. On the death of William, Roger supported the claim of his eldest son Robert to the throne, which led to the devastation of the county. Bigod was obliged to submit to William Rufus.

Of the edifices of the middle ages, monastic, ecclesiastical, or castellated, Norfolk has several remains in addition to those already mentioned, among which are—Langley Abbey, the abbey of St. Bennet of Hulme, Broomhall Priory, Beeston Priory, Binham Priory, Castle Acre, Castle Rising, Caistor Castle, and several manor-houses.

NORFOLK. [VIRGINIA.]

NORFOLK ISLAND is situated in the Pacific Ocean, between 29° and 29° 10′ S. lat., and 168° and 168° 5′ E. long., about 900 miles from Port Jackson in Australia. It is about six miles long from north-west to south-east, and nearly four in breadth. As the soil of the island is very fertile, a British settlement was formed in 1789, from Sydney in Australia; but from various causes it was abandoned. Norfolk Island has since

been made a penal colony for convicts from New South Wales.

NORIC ALPS. [ALPS.]

NO'RICUM, a province of the Roman empire, was bounded on the N. by the Danube, on the W. by Vindelicia and Rhætia, on the E. by Pannonia, and on the S. by Illyricum and Gallia Cisalpina. It was separated from Vindelicia by the Œnus (Inn), and from Gallia Cisalpina by the Alpes Carnicæ, or Juliæ; but it is difficult to determine the boundaries between Noricum and Pannonia, as they differed at various times.

Noricum was divided into two nearly equal parts by a branch of the Alps, which was called the Alpes Noricæ. Noricum appears to have been a Roman province in the time of Claudius. The chief towns were, Juvanum (Salzburg), in the western part of the province, Boiodurum (Innstadt), at the junction of the Inn and Danube, and Ovilia, or Ovilava (Wels) south-east of Boiodurum, a Roman colony founded by Marcus Aurelius.

NORMA, the Rule, a constellation of Lacaille, situated between Scorpio and Lupus.

NORMAL, in Geometry (from *norma*), generally means a perpendicular drawn to the tangent line of a curve, or the tangent plane of a surface. It formerly meant simply *perpendicular*.

NORMAN ARCHITECTURE. Some remarks upon this style have already been made in the article GOTHIC ARCHITECTURE. Being imported into this country at the time of the Conquest, it has obtained among us the epithet of *Anglo-Norman*. The Anglo-Norman period of our architecture may be said to extend to nearly the close of the reign of Henry II., 1189; but there are very few buildings entirely in this style. A great deal of Norman work is to be met with in the older parts of several of our cathedrals, and also in many smaller churches, such as Barfreston in Kent; New Shoreham, Sussex; Iffley, Oxfordshire, &c., which exhibit more of the Norman style and the peculiar mode of applying it than many larger edifices. The older parts of Canterbury, Winchester, Gloucester, Ely, Durham, Norwich, Lincoln, and Oxford cathedrals are in this style. The nave and choir of Norwich in particular (founded in 1096), with the exception of pointed windows of later English character, are almost entirely Norman, of which they present a very fine example. The west fronts of Rochester and Lincoln cathedrals are almost the only parts that can be considered as specimens of Anglo-Norman architecture; yet each of them has many interpolations of other styles. Wherever a superior degree of decoration was aimed at, the Anglo-Norman builders seem to have contented themselves with covering what would else have been blank surfaces with tiers of columns and arches of the kind referred to. The two transept towers of Exeter Cathedral, the front of Castle-Acre Priory, and of St. Botolph's Priory, Colchester, present little more; consequently, notwithstanding the variety as to detail, there is, as was also the case with Grecian architecture, a very great sameness as to general composition and design.

In the interiors of buildings this style exhibits itself more decidedly, owing not only to the perspective effect of a succession of spacious open arches, as in the naves of Norwich, Rochester, Chichester, Ely, and Peterborough cathedrals, but also to greater size and massiveness. Although such difference of character may at first appear somewhat incongruous, the reason for it is evident; the tiers of pillars and arches on the exterior of Norman structures are merely decorations of the surface, while the arches and piers within are essential parts of the fabric.

Having spoken of the style generally, we shall now briefly describe its principal component parts.

Doorways, even in small and otherwise plain buildings, and even when small in themselves, seem always to have had a great deal of embellishment bestowed upon them. In many instances they are very deeply recessed, and in proportion to the aperture or door itself, the dressings or decorations occupy a great space. The following specimen is copied from the doorway of Barfreston church, in Kent.

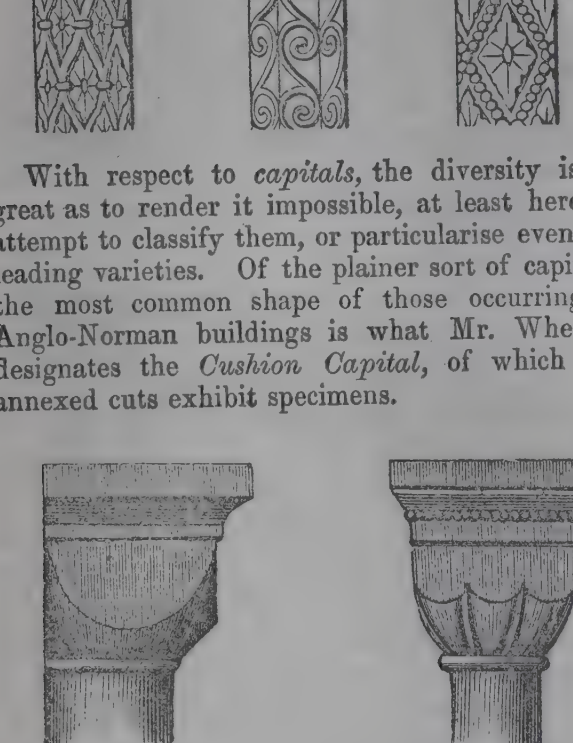
The zigzag moulding was a very favourite ornament with the Normans, both for archivolts and other decorative mouldings.

Windows had scarcely ever much decoration; they were generally small and placed at a considerable distance from each other; sometimes too merely plain apertures in the wall, and rarely more than scantily ornamented.

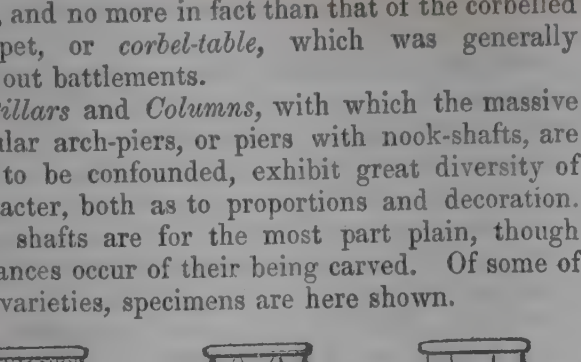
Buttresses, to which buildings in the Gothic style are indebted for so much of their character and effect, can hardly be said to exist in either Norman or Lombardic architecture. The enormous thickness of the walls and their solidity, owing to the smallness and infrequency of apertures in them, rendered such additional support unnecessary, even where the vaulting of the roof was large and bold. Hence nothing more than either *buttress-strips*, or *pilaster-strips* (as they are conveniently termed by Mr. Whewell), were introduced, and these more for the sake of producing

some variety and degree of expression than for actual strength, their projection beyond the general plane of the wall being very inconsiderable, and no more in fact than that of the corbelled parapet, or *corbel-table*, which was generally without battlements.

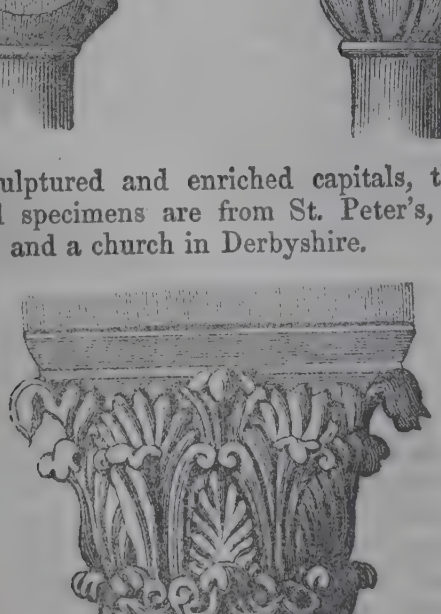
Pillars and *Columns*, with which the massive circular arch-piers, or piers with nook-shafts, are not to be confounded, exhibit great diversity of character, both as to proportions and decoration. The shafts are for the most part plain, though instances occur of their being carved. Of some of the varieties, specimens are here shown.

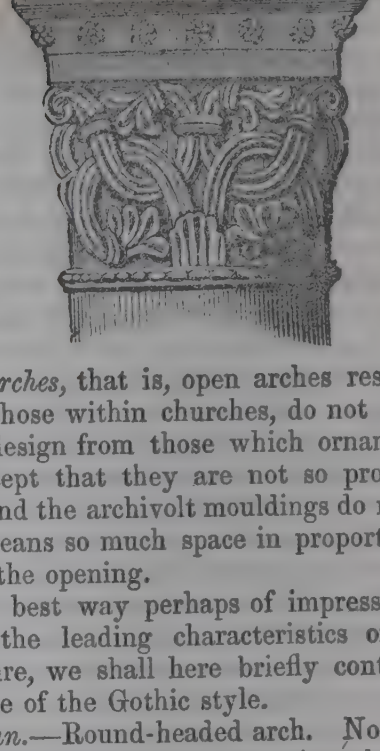


With respect to *capitals*, the diversity is so great as to render it impossible, at least here, to attempt to classify them, or particularise even the leading varieties. Of the plainer sort of capitals, the most common shape of those occurring in Anglo-Norman buildings is what Mr. Whewell designates the *Cushion Capital*, of which the annexed cuts exhibit specimens.



Of sculptured and enriched capitals, the two annexed specimens are from St. Peter's, Northampton, and a church in Derbyshire.





Pier-Arches, that is, open arches resting upon piers, as those within churches, do not materially differ in design from those which ornament doorways, except that they are not so profusely decorated, and the archivolt mouldings do not occupy by any means so much space in proportion to the width of the opening.

As the best way perhaps of impressing on the memory the leading characteristics of Norman architecture, we shall here briefly contrast them with those of the Gothic style.

Norman.—Round-headed arch. No tracery in windows. Buttress-strips. No pinnacles. Battlements, doubtful if any. Spires scarcely known. Splayed surfaces of rare occurrence. Niches ditto. Windows generally small and few. Horizontal lines and arrangements prevalent. Arch-piers very massive. Vaulting simple and mostly plain.

Gothic.—Pointed arch, varying in proportions. Windows with mullions, transoms, and tracery. Buttresses rising in offsets or stages. Pinnacles. Battlements in the ecclesiastical as well as military style. Spires characteristic features. Splays for receding parts, universal. Niches very general. Windows spacious and numerous. Vertical lines and arrangements. Arch-piers comparatively slender. Vaulting complex and decorated.

NORMANDIE, the ancient *Neustria*, one of the provinces into which France was divided before the first Revolution, was bounded N. and W. by the English Channel, E. by Picardie and Ile-de-France, and S. by Maine and Bretagne. It was about 144 miles long, 72 broad, and had about 200 miles of coast. At the time of the conquest of Gaul by the Romans this province formed part of Gallia Celtica; under the Empire it was included in Lugdunensis Secunda. On the decay of the Roman power it was reduced to subjection by the Franks, from whom it was wrested in 876 by the Northmen or Normans, under Rollo, and governed by its own dukes till the time of William the Conqueror, after whose conquest of England it was subject to the English kings till 1204, when Philippe Auguste united it to the dominions of France. The English again seized it, and held it from 1419 to 1425, in which year Charles VII drove them from the territory of France. The dukes of Normandie were great vassals of the French crown. The history of the country is closely interwoven with the histories of France and England. The province before the revolution had a parliament of its own which sat at Rouen. In religious matters it was subject to the

archbishop of Rouen, whose see was coextensive with the province; he had six suffragan bishops, who took their titles from Lisieux, Avranches, Coutances, Séez, Bayeux, and Évreux.

Normandie was divided into Haute-Normandie, which comprised the districts of Caux, Bray, the Norman Vexin, Roumois, Auge, and Lieuvin; and Basse-Normandie, comprising the plains of Alençon, and Caen, together with the districts of Houlme, Bessin, Bocage, Cotentin, and Avranchin. It now forms the departments of SEINE-INFERIEURE, EURE, CALVADOS, MANCHE, and of ORNE, with the exception of the arrondissement of Mortagne.

The following works on the history of Normandie may be referred to with advantage:—Michel, 'Chroniques-Anglo-Normands,' 3 vols. 8vo.; Vital, 'Histoire de Normandie,' edited by Guizot, 4 vols. 8vo.; Marie du Mesnil, 'Chroniques Neustriennes,' 1 vol. 8vo.; Thierry, 'Histoire de la Conquête de l'Angleterre.'

NORMANDY, CUSTOMARY LAW OF. Previous to the first Revolution the several provinces into which France was divided were chiefly governed by customs, 'coutumes,' which have been largely commented upon by various jurists. The customary of Normandy, if not the most ancient, ranks among the most ancient of the French provincial customaries. According to this customary, laws, customs, and usages, were different: the laws were enacted by the sovereign power, reduced to writing, and registered by the exchequer, afterwards denominated the parliament of Rouen; its customs originated with the people, and in time were compiled and reduced to writing by the supreme authority. Hence the difference between 'loi,' 'us,' and 'coutume,' as understood in the ancient provinces of France. By 'loi' or law was understood the royal ordinances and Roman law; by 'coutumes' or customs those regulations which had been reduced to writing and received the sanction of the sovereign; by 'us' or usage, such regulations as had not been reduced to writing. Normandy, as an independent state, and after its annexation to the crown of France under Philip Augustus, may be said to have had three distinct codes; 'le grand coutumier,' or ancient customary, 'la charte aux Normands,' or Norman charter, and the modern custom. The ancient and modern customs related more particularly to property, &c.; 'la charte aux Normands,' to the political liberty of the subject. The Norman charter was granted by Louis X., and its principal object was to restrain the kings of France from imposing too heavy burdens on their Norman subjects.

'L'Ancien Coutumier' is divided into 125 chapters, nearly two-thirds of which are devoted to regulate the duties of the judicial officers, the proceedings in the different courts, and the respective rights and obligations of the kings of France, the dukes of Normandy, the feudal lords and people.

The modern or reformed 'Coutumier de Normandie' is divided into 24 chapters, which are subdivided into 622 articles. The modern 'Coutume' was reformed at Rouen on July 1, 1585, by commissioners appointed by Henry III. of France, with the concurrence of the provincial authorities known as 'les gens des trois états,' or three orders representing the nobility, clergy, and people.

The first commentary on the Grand Coutumier of Normandy was by Rouillé, a jurist of Alençon, fol., 1534: it was followed by that of Terrien of Dieppe. The former is more generally received as an authority in Jersey, and the latter in Guernsey.

Hale, in his 'History of the Common Law of England' (chap. vi.), maintains that the 'Coutumier of Normandy' was written long after Glanville's tract, which was written in Henry II.'s time; and that the Norman collection was made after the time of Henry II. appears from its mentioning his coronation, and appointing it for the limitation of actions ancestral, which must at least have been thirty years after. 'Nay, the 'Coutumier' appears to have been made after the act of settlement of Normandy in the crown of France, for therein is specified the institution of Philip king of France, for appointing the coronation of king Richard I. for the limitation of actions, which was after the said Philip's full possession of Normandy.' Hale's opinion is, that 'this similitude of the laws of England and Normandy was not by conformation of the laws of England to those of Normandy, but by conformation of the laws of Normandy to England.'

NORONHA, FERNANDO DE, is a small group of islands, belonging to Brazil, and situated in the Atlantic Ocean. The fort Concepçaõ on the principal island is situated 3° 50′ N. lat., and 32° 25′ W. long. The group consists of two islands of moderate size, Fernando de Noronha and Dos Ratos, and a few rocks. Fernando de Noronha is about ten miles long, and about three across in the widest part.

NORRKÖPING, a town of about 12,000 inhabitants, in Sweden, situated in 58° 36′ N. lat., 16° 28′ E. long., on the banks of the river Motala, which falls into an inlet of the Baltic, a short distance below the town. It is built on both sides of the river. The streets are wide and generally straight, though the town stands on undulating ground; the houses, partly of wood and partly of stone, are only two stories high, but have a neat appearance. The most important manufactures are woollen cloth, brass ware, snuff, and paper. Several vessels are annually built. Iron is also an important article of export. Most of the grain grown in the plain of Linköping is also shipped at this harbour.

NORROY. [HERALD.]

NORT. [LOIRÉ-INFÉRIEURE.]

NORTH AMERICAN INDIANS. When the Europeans began to visit the coast of North America, they found that continent inhabited by a great number of nations. In the most northern regions there were tribes which differed considerably from the rest in their physical character. These northern tribes, which belong to one nation and speak one language, are called Esquimaux; and are supposed to belong to the Mongol race. [ESQUIMAUX.] Humboldt observes that the fore-

head of the North-American Indians, as distinguished from the Esquimaux, is considerably inclined backwards, and with it the whole facial line, while in the Mongol race it approaches much more to the form of the skull of the Caucasian race. It would seem therefore that America has not been entirely peopled by any of the nations which inhabit the eastern countries of Asia, for all of them, from the Gulf of Siam to Behring's Strait, exhibit the characteristic features of the Mongol race.

When the Europeans began to settle on the eastern shores of North America, the adjacent countries were inhabited by aboriginal tribes, some of which are stated to have been very numerous. In the space of about 200 years many of these tribes have entirely disappeared, and others have left the eastern country and retreated into the interior. The destruction of these tribes has been produced, directly or indirectly, by the settling of the Europeans in America.

The Indians in the countries east of the Mississippi, in recent times, inhabited distinct districts, but were surrounded by a white population. The whites did not always behave towards them according to the rules of justice, and this created ill-will in the minds of the Indians. Accordingly the Indians usually joined the enemies of the republic, as appeared in 1811, when they joined the Spaniards, and in 1812, when they joined the British. The general government of the United States was well aware of the danger of having such subjects within their territories, and therefore wished to remove them to those parts of their territories where no invasion of an enemy could be feared, and where they would have connection with the great bulk of the white population. Still no effective steps for this purpose were taken till 1834, when the state of Georgia expelled the Cherokees from its territories, and at the same time the Seminoles in Florida began to make war on their white neighbours. The executive of the general government was now empowered to remove the Indians to the west of the river Mississippi, under treaties, and to assign them territories with fixed boundaries. The country assigned to them is situated to the west of the states of Arkansas, Missouri, and Iowa. The greatest part of this country consists of extensive prairies without trees or water, but fertile bottoms occur along the courses of the rivers, which are considered quite sufficient to maintain the scanty population of Indians. A good price was stipulated for the cession of the tracts inhabited by the Indians, and the money was divided into three unequal parts. One part of the money was appropriated to the liquidation of the debts which the tribes and the individuals composing them had contracted with their white neighbours; another part was appropriated to paying the expenses of their removal and those incurred in the establishment of the new settlements; and the third was to provide an annuity until they should have ample means of procuring subsistence. Under such treaties, the Indians, who, up to the year 1836, had resided east of the Mississippi have since been removed to the west of that river. The following table is taken from a Report of the Commissioners of Indian Affairs, dated Nov. 1838, and shows the number of individuals who belonged to each tribe at the time when the treaties were concluded :—

Names of the Tribes.	Number.
Chippewas, Ottawas, and Pottawatomies	8,000
Pottawatomies of Indiana	1,786
Choctaws	18,500
Quapaws	476
Creeks	22,000
Florida Indians	3,765
Cherokees	22,000
Kickapoos	588
Delawares	826
Shawnees	1,272
Ottowas	420
Weas	225
Piankeshaws	162
Peorias and Kaskaskias	132
Senecas from Sandusky	251
Senecas and Shawnees	211
Ottowas and Chippewas	6,500
Winnebagoes	4,500
New York Indians	4,176
Chickasaws	5,000
	100,790

The Choctaws and Chickasaws occupied a large portion of the state of Mississippi, and are now established in the neighbourhood of the Red River and the Arkansas. The Creeks, who possessed an extensive tract in Alabama, and the Florida Indians (the Seminoles), are now settled, partly on the northern fork of the Canadian River, and partly on the Arkansas. The Cherokees, who occupied a portion of Georgia and Alabama, are now established on the bottoms of the Arkansas. The Senecas and Shawnees, who were in Illinois and the Quapaws, who were in Arkansas, have also been removed to the bottoms of the river Arkansas. The Chippewas, Ottawas, and Pottawatomies, were removed from Michigan to the banks of the Missouri, north of its confluence with the Kanzas, in which locality are also settled the Delawares, Shawnees, and Kickapoos. Some of these tribes have entirely given up the chase and begun to cultivate the countries assigned to them with great industry, raising maize, peas, beans, potatoes, and melons, in abundance. Most of the others mix the chase with agricultural pursuits.

Most of the tribes bordering on the newly settled Indians are in this semi-barbarous condition, as the Osages on the Osage river, the Kanzas on the Kanzas, the Pawnees on the Platte, the Otoes and Missourias, and the Omahas, who live in the valley of the Missouri north of its confluence with the Platte, and finally the Mandans and Minitaries. The tribes which occupy the country between the Missouri and Mississippi are perhaps not much more advanced in civilisation, but they have begun to use the plough, and even the male population take part in agricultural labours. Formerly the field-labour was left to the squaws, or women, who used only the hoe.

The aboriginal tribes, which entirely subsist on the produce of the chase, and have no permanent residence, are found within the territories of the United States only along the Chippewyan Mountains, and range over the extensive desert which stretches from the base of the mountains about 400 miles eastward. The number of these wandering tribes is very great, but most of them belong to two great nations, known by the names of the Sioux and Blackfeet.

In Lower Canada there are only small remnants of the once powerful tribes of the Iroquois, or Mohawk Indians, the Algonquins, and Hurons, who live in small villages, amidst the white settlers, and having adopted agricultural habits, raise maize, wheat, potatoes, and other articles. The Mic-Macs, who occupy the shores of the Bay of Chaleurs and the banks of the river Ristogouche, are more numerous. They live by fishing, and do not cultivate any kind of vegetables. The mountainous country north of the St. Lawrence, on both sides of the Saguenay, the shores of St. John's Lake, and the interior of Labrador, are occupied by the tribes of a nation which is called Montagnais, or Mountain Indians, who wander about in that extensive region without any fixed residences, and live by hunting and fishing.

The tribes which still occupy a great portion of Upper Canada are more numerous. A large part of the country between the river Ottawa and Lake Huron is still in their possession. The principal nations in this tract are the Ottawas and Chippewas, who are allied with the tribes known by the same name who occupied part of Michigan. They live in the countries which surround Georgian Bay on the south, and on the Manitoulin Islands. The Missisaqua Indians occupy the eastern shores of the Georgian Bay. All these tribes live by hunting, and possess a country rich in game and fur-bearing animals. The shores of Lake Superior, as well in Upper Canada as in the United States, are inhabited by the Ojibewas, who seem to be only a branch of the Crees who inhabit the shores of Hudson's Bay and the banks of the Churchill River. These nations are hunters. The country on both sides of the boundary-line between the United States and the British possessions, and extending from Lake Superior to the Chippewyan Mountains, is in possession of two nations, the Chippewas and Assinaboins.

North of Athabasca Lake and along the shores of Slave River and Mackenzie River are the Beaver Indians, the Hare Indians, and the Louchen Indians, and in the countries east of the river the Copper and Dogrib Indians. The three last-mentioned tribes are separated from the Icy Sea by the Esquimaux, who occupy the shores of that sea. All these tribes live principally by hunting, but they also fish in the extensive lakes which cover a great portion of their country.

The most powerful tribes on the banks of the Columbia River are the Snake Indians, or Shoshonees, and the Flatheads. The Shoshonees occupy the countries on the southern and the Flatheads those on the northern branches of the Columbia River.

NORTH-BERWICK. [HADDINGTONSHIRE.]

NORTH SEA, or the GERMAN OCEAN, is separated from the Atlantic by the British Islands, which form its western limits, and on the opposite side by Norway and Denmark from the Baltic. To the southward it is bounded by the coasts of France, Belgium, the Netherlands, and Germany; and to the northward an open space between the Shetland Isles and the Norwegian province of Bergen unites it to the Polar Sea. With the Atlantic it is connected through the Strait of Dover by the English Channel; and with the Baltic by the broad gulf called the Skagerrack. It extends across ten degrees of latitude and eleven of longitude; its greatest length may therefore be taken at 600 geographical miles, its extreme breadth at 350, and its superficies at about 140,000 square miles.

On its north-eastern side the shores are bold and rocky; but in most other parts they are low and sandy. The sand from the rivers is swept by the alternate flood and ebb into long sinuous and shallow banks, which, rising in narrow ridges towards the surface, place themselves in directions parallel to the contiguous shores. All these shoals and banks obstruct the free navigation of the sea, and, combined with the stormy and foggy character of the climate, have led to the destruction of an immense number of vessels. Among other sand banks are those designated the Long North Bank, the Dogger Bank, the Well Bank, and the Broad Fourteens. The deep holes which are found in this sea form another of its singular features; the chief among them are the Little Silver Pit, the Great Silver Pit, and the North-north-east Hole. In these pits the depth of water is very great.

One island only interrupts the uniformity of this sea, Heligoland Rock, which lies off the mouth of the Elbe, unless the Bell Rock and the May Rock, situated in the opening of the Frith of Forth, may be so called: on each of these three insulated spots lighthouses have been erected.

The abundance of fish in the German Ocean has in all ages been celebrated, and the protection of its fisheries has given rise to more than one national quarrel.

The course of the tides in the German Ocean is extremely varied and complex.

NORTH-WEST PASSAGE. If a vessel by sailing from the western shores of Europe in a north-west direction were to enter the Pacific, it would be said to have made the North-West Passage.

In 1500 Gaspar de Cortereal was sent out by the Portuguese to make the North-West Passage. He discovered a large part of the north-eastern coast of Labrador, to the extent of 600 or 700 miles, and is supposed to have discovered Hudson's Strait. Sebastian Cabot made an unsuccessful voyage to those regions in 1517. The attempts of the English were at first directed to the discovery of a North-East Passage, by which it was proposed to reach the Pacific by sailing from west to east along the northern shores of Asia. The real extent of the continent of Asia

was then unknown. Three vessels sailed under the command of Sir Hugh Willoughby and Richard Chancellor in 1553, but the only result of the expedition was the discovery of the White Sea. The Dutch merchants next resolved to try if it was possible to reach the East Indies by a North-East Passage. William Barentz made two voyages (1594–1596), but was unable to proceed east of Nova Zembla and the Strait of Waygatz, on account of the quantity of ice which always covers the sea to the east of that island. Since his last voyage, in which he passed the winter on Nova Zembla, the North-East Passage has been given up as impracticable.

In the meantime the North-West Passage was lost sight of until the year 1576, when the attempt was again made by the English. Frobisher discovered Frobisher's Strait, and visited Hudson's Strait, in 1577–8. Davis discovered Davis's Strait and Cumberland Strait in 1585–6–7. Hudson passed through the strait into the bay named after him. In 1612–14, Button, Bylot, and Baffin made many discoveries in and around Baffin's Bay. In 1631, James and Fox explored much of the region around Hudson's Strait.

While the English were pursuing their discoveries on the north-eastern shores of North America nearly without interruption, the Spaniards made some feeble attempts along the north-western coast with the view of finding a North-East Passage to the Atlantic. Their voyages led to no important result.

When the distinguished navigator Cook entered on his last voyage of discovery, he was instructed to try how far he could advance northward between Asia and America. He reached Icy Cape (70° N. lat.), where he found that a barrier of ice extended from one continent to the other. It was found during the same century that no outlet to the Atlantic exists south of Icy Cape, whatever there may be northward of that point.

The question as to the existence of a North-West Passage now seemed to be decided in the negative, until the whalers who annually visit the sea on both sides of Greenland reported that in the years 1816 and 1817 the arctic seas were much less encumbered with ice than had ever been observed. The British government now resolved to make an attempt to settle this question. In 1818 two vessels were despatched, under the command of Captain (now Sir) John Ross and Lieutenant (now Sir Edward) Parry, to re-examine the shores of Baffin's Bay. The principal result was to convince Parry that Lancaster Sound was worthy of more exploration; and in 1819–22 he traversed the Sound to a distance of 540 miles, and discovered Cornwallis, Bathurst, Melville, Cockburn, and Winter Islands, Banks's Land, Regent's Inlet, Lyon's Inlet, Fury and Hecla Strait, and Repulse Bay. The result of this attempt showed that Fury and Hecla Strait did not allow a navigable North-West Passage. Parry, whose success had deservedly secured the confidence of government, again obtained the same vessels for the purpose of trying whether Regent's Inlet, which, according to the information obtained from the Esquimaux, stretches far to the south, might not allow a passage. The expedition of 1824-5 did not meet with much success; but it yet seemed probable that a navigable North-West Passage might exist through Regent's Inlet. A wealthy individual, Sir Felix Booth, furnished all the expenses for a new adventure, the direction of which was given to Ross; who, during a severe trial of difficulties in those regions, from 1829 to 1832, discovered land, which he called Boothia Felix; while his nephew (now Sir James Clark Ross) discovered the position of the North Magnetic Pole; but not much was effected towards the discovery of a North-West Passage.

It was then supposed that a strait might exist between the mainland and Boothia Felix; and successive portions of the northern coast of America were discovered. Between the discoveries of Captain Beechey, who advanced to Point Barrow (71° 28′ N. lat., and 156° 10′ W. long.), and those of Sir John Franklin, who went as far as Point Beechey (70° 30′ N. lat., and 150° W. long.), only a coast-line of about 130 miles remained undiscovered, and this tract was explored, in 1837, by Messrs. Dease and Simpson, agents of the Hudson's Bay Company. East of the Mackenzie river the coast-line as far as Point Turnagain (near 109° W. long., and 68° 30′ N. lat.) was discovered by Sir John Franklin and Doctor (now Sir John) Richardson, and the distance between this cape and Point Victory, does not much exceed 300 miles. Dease and Simpson advanced to 106° W. long. in 1838, so that the whole distance left unexplored, did not much exceed 200 miles; and in the next year, they advanced as far east as 93° W. long. Captain (now Sir George) Back made two journeys to the same regions, in one of which he made many discoveries near 96° W. long.

In 1845 the British government again sent out an expedition under Sir John Franklin and Captain Crozier, in the ships Erebus and Terror. The expedition was to advance through Baffin's Bay to Barrow's Straits, and then endeavour to find an outlet towards the west. An interval of more than four years has now elapsed (Aug. 1849), and nothing has yet been heard of the expedition. Three parties have been despatched by government in search of the missing navigators—one by way of Behring's Strait, another by Barrow's Strait, and a third by the Mackenzie River; and the Hudson's Bay Company have offered their assistance in the search.

In 1846 and 1847, Dr. John Rae, under the auspices of the Hudson's Bay Company, explored the coast from Lord Mayor's Bay to 69° 42′ N. lat. 85° 8′ W. long., a point within a few miles of the Fury and Hecla Strait. The result confirms Ross's conjecture that Boothia is a peninsula connected with the mainland of America, and not an island.

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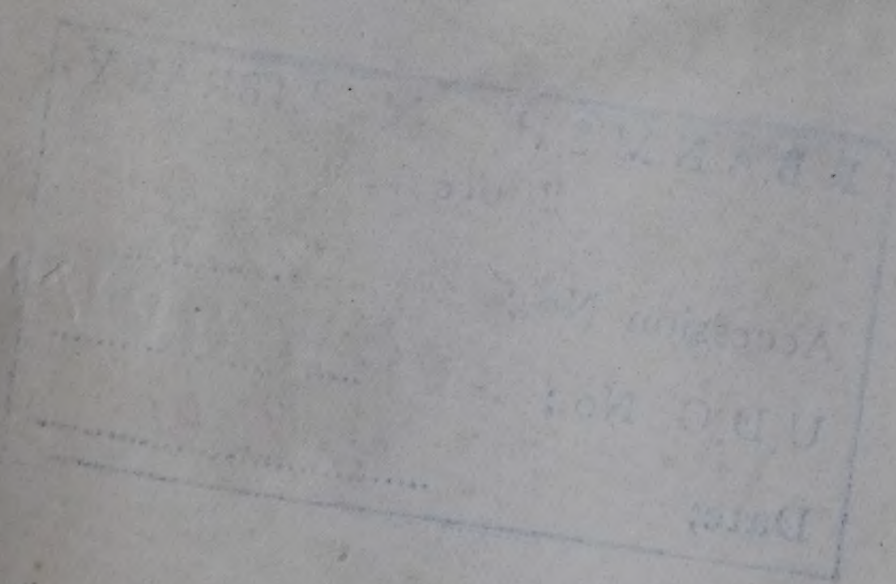

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